0057858



June 21, 2002

Ms. Joan Kessner Bechtel Hanford Inc. 3350 George Washington Way Richland, WA 99352 MSIN: H0-25

Reference:

P.O. #630

Eberline Services R2-04-133-7267, SDG H1760

Dear Ms. Kessner:

Enclosed is the data report one solid sample designated under SAF No. B02-050 received at Eberline Services on April 30, 2002. The sample was analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion

Melera Marmon

Program Manager

MCM

Enclosure: Data Package





Analytical Services
2030 Wright Avenue

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1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1760 was composed of one solid (soil) sample designated under SAF No. B02-050 with a Project Designation of: 216-Z-11 Ditch Borehole Samples.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.8 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.9 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.10 Transplutonic Analyses (Am-241 and Cm-243/244)

No problems were encountered during the course of the analyses.

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2.11 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa C. Mannion
Program Manager

<u>4/21/02</u> Date

E B E R L I N E S E R V I C E S / R I C H M O N D SAMPLE DELIVERY GROUP H1760

SDG <u>7267</u> Contact <u>Melissa C. Mannion</u> Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG_H1760</u>

SUMMARY DATA SECTION

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Mllim	Mann	
Prepared	by	
Melisa	Mamma	
Reviewed	by	

SAMPLE DELIVERY GROUP H1760

SDG 7267
Contact Melissa C. Mannion

REPORT GUIDE

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1760</u>

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

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SAMPLE DELIVERY GROUP H1760

SDG 7267
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H1760

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

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SAMPLE DELIVERY GROUP #1760

SDG 7267 Contact Melissa C. Mannion

SAMPLE SUMMARY

Client <u>Hanford</u> Contract No. 630 Case no SDG H1760

CLIENT SAMPLE ID	LOCATION	MATRIX LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B14DJ8	200 West	SOLID	R204133-01	B02-050	802-050-01	04/23/02 12:40
Method Blank		SOLID	R204133-03	B02-050		- 1, -0, 12 , 121 , 1
Lab Control Sample		SOLID	R204133-02	B02-050		
Duplicate (R204133-01)	200 West	SOLID	R204133-04	B02-050		04/23/02 12:40
Spike (R204133-01)	200 West	SOLID	R204133-05	B02-050		04/23/02 12:40

SAMPLE SUMMARY Page 1 SUMMARY DATA SECTION Page 3

SDG 7267 Contact Melissa C. Mannion

QC SUMMARY

Client	Hanford
Contract	No. 630
Case no	SDG H1760

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS S		LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7267	в02-050-01	B14DJ8	SOLID	92.4	1161 g		04/30/02	7	R204133-01	7267-001
		Method Blank	SOLID						R204133-03	7267-003
		Lab Control Sample	SOLID						R204133-02	7267-002
		Duplicate (R204133-01)	SOL ID	92.4	1161 g		04/30/02	7	R204133-04	7267-004
		Spike (R204133-01)	SOLID		1161 g		04/30/02	7	R204133-05	7267-005

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-QS</u>
Version <u>3.06</u>
Report date <u>06/21/02</u>

SDG	7267		
Contact	Melissa	c.	Mannion

PREP BATCH SUMMARY

Client	Hanford
Contract	No. 630
Case no	SDG H1760

			PREPARATION	ERROR			- PLA	NCHETS	ANALYZ	ED	QUALI-
TEST	MATRIX	METHOD	BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG MS/ORIG	FIERS
Alpha	Spectros	сору								- 100-	
NP	SOLID	Neptunium in Soil	7024-201	5.0	1			1	1	1/1	
PŲ	SOLID	Plutonium, Isotopic in Solids	7024-201	5.0	1			1	1	1/1	
тн	SOLID	Thorium, Isotopic in Soil	7024-201	5.0	1			1	1	1/1	
TP	SOLID	Americium 241/Curium in Solids	7024-201	5.0	1			1	1	1/1	
U	SOLID	Uranium, Isotopic in Soil	7024-201	5.0	1			1	1	1/1	
Beta	Counting										
SR	SOLID	Total Strontium in Soil	7024-201	10.0	1			1	1	1/1	
TC	SOLID	Technetium 99 in Soil	7024-201	10.0	1			1	1	1/1	
Gamma	Spectros	сору			•						
GAM	SOLID	Gamma Scan	7024-201	15.0	1			1	1	1/1	
Liqui	d Scintil	lation Counting						•			
C	SOLID	Carbon 14 in Soil	7024-201	10.0	1			1	1	1/1	
н	SOLID	Tritium in Soil	7024-201	10.0	1			1	1	1/1 1/1	х
NI_L	SOLID	Nickel 63 in Soil	7024-201	10.0	1			1	1	1/1	
											

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

8 Stank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-PBS</u>

Version <u>3.06</u>

Report date <u>06/21/02</u>

SDG 7267
Contact Melissa C. Mannion

WORK SUMMARY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1760</u>

CLIENT SAMPLE	ID		LAB SAMPLE II	0						
LOCATION	SAF No	MATRIX	COLLECTED RECEIVED	PLANCHET	TEST	SUF-	ANAL YZED	REVIEWED	вү	METHON
	SAI NO		RECEIVED	FEARCIET	1631	LIV	ANALIZED	KEATEMEN	ьт	METHOD
B140J8			R204133-01	7267-001	С		05/31/02	06/20/02	MCM	Carbon 14 in Soil
200 West		SOLID	04/23/02	7267-001	GAM		06/11/02	06/20/02	MCM	Gamma Scan
B02-050-01	B02-050		04/30/02	7267-001	H		06/08/02	06/20/02	MCM	Tritium in Soil
				7267-001	NI_L		06/12/02	06/20/02	MCM	Nickel 63 in Soil
				7267-001	NP		06/19/02	06/20/02	MCM	Neptunium in Soil
				7267-001	PU		06/13/02	06/20/02	MCM	Plutonium, Isotopic in Solids
				7267-001	SR		06/12/02	06/20/02	MCM	Total Strontium in Soil
				7267-001	TC		06/20/02	06/20/02	MCM	Technetium 99 in Soit
				7267-001	TH		06/13/02	06/20/02	MCM	Thorium, Isotopic in Soil
				7267-001	TP		06/15/02	06/20/02	MCM	Americium 241/Curium in Solic
				7267-001	U		06/11/02	06/20/02	MCM	Uranium, Isotopic in Soil
Method Blank			R204133-03	7267-003	C		05/31/02	06/20/02	MCM	Carbon 14 in Soil
		SOLID		7267-003	GAM		06/11/02	06/20/02	MCM	Gamma Scan
	B02-050			7267-003	Н		06/08/02	06/20/02	MCM	Tritium in Soil
				7267-003	NI_L		06/12/02	06/20/02	MCM	Nickel 63 in Soil
				7267-003	NP		06/19/02	06/20/02	MCM	Neptunium in Soil
				7267-003	PU		06/13/02	06/20/02	MCM	Plutonium, Isotopic in Solids
				7267-003	SR		06/12/02	06/20/02	MCM	Total Strontium in Soil
				7267-003	TC		06/20/02	06/20/02	MCM	Technetium 99 in Soil
				7267-003	TH		06/13/02	06/20/02	MCM	Thorium, Isotopic in Soil
				7267-003	TP		06/15/02	06/20/02	MCM	Americium 241/Curium in Solid
				7267-003	U		06/11/02	06/20/02	MCM	Uranium, Isotopic in Soil
ab Control Sar	mple		R204133-02	7267-002	С		05/31/02	06/20/02	MCM	Carbon 14 in Soil
		SOLID		7267-002	GAM		06/10/02	06/20/02	MCM	Gamma Scan
	B02-050			7267-002	Н		06/08/02	06/20/02	MCM	Tritium in Soil
				7267-002	NI_L		06/12/02	06/20/02	MCM	Nickel 63 in Soil
				7267-002	NP			06/20/02	MCM	Neptunium in Soil
				7267-002	PU		06/13/02	06/20/02	МСМ	Plutonium, Isotopic in Solids
				7267-002	SR			06/20/02	MCM	Total Strontium in Soil
				7267-002	TC			06/20/02	MCM	Technetium 99 in Soil
				7267-002	TH			06/20/02	MCM	Thorium, Isotopic in Soil
				7267-002	TP		06/15/02		MCM	Americium 241/Curium in Solid
				7267-002	Ü		06/11/02		MCM	Uranium, Isotopic in Soil

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-CWS</u>
Version <u>3.06</u>
Report date <u>06/21/02</u>

SDG 7267 Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1760</u>

CLIENT SAMPLE	E ID	MATRIX	LAB SAMPLE ID	ŀ		SUF-				
CUSTODY	SAF No	HAINIA	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (RZ	204133-01)		R204133-04	7267-004	C		05/31/02	06/20/02	MCM	Carbon 14 in Soil
200 West		SOLID	04/23/02	7267-004	GAM		06/10/02	06/20/02	MCM	Gamma Scan
	B02-050		04/30/02	7267-004	H		06/08/02	06/20/02	MCM	Tritium in Soil
				7267-004	NI_L		06/12/02	06/20/02	MCM	Nickel 63 in Soil
				7267-004	NP		06/19/02	06/20/02	MCM	Neptunium in Soil
				7267-004	PU		06/13/02	06/20/02	MCM	Plutonium, Isotopic in Solids
				7267-004	SR		06/12/02	06/20/02	MCM	Total Strontium in Soil
				7267-004	TC		06/19/02	06/20/02	MCM	Technetium 99 in Soil
				7267-004	TH		06/13/02	06/20/02	MCM	Thorium, Isotopic in Soil
				7267-004	TP		06/15/02	06/20/02	MCM	Americium 241/Curium in Solids
				7267-004	U		06/11/02	06/20/02	MCM	Uranium, Isotopic in Soil
Spike (R20413	3-01)		R204133-05	7267-005	Н		06/08/02	06/20/02	MCM	Tritium in Soil
200 West		SOLID	04/23/02							
	802-050		04/30/02				•			

TEST	SAF No	COUNTS OF	TESTS BY SAI	MPLE TYPE CLIENT MORE	RE BLANK	LCS	DUP SPIKE	TOTAL
С	B02-050	Carbon 14 in Soil	C14_COX_LSC	1	1	1	1	4
GAM	B02-050	Gamma Scan	GAMMA_GS	1	1	1	1	4
н	B02-050	Tritium in Soil	906.0_H3_LSC	1	1	1	1 1	5
NI_L	B02-050	Nickel 63 in Soil	N163_LSC	1	1	1	1	4
NP	B02-050	Neptunium in Soil	NP237_LLE_PLATE_AEA	1	1	1	1	4
PU	B02-050	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1	1	1	1	4
SR	B02-050	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1	1	1	1	4
TC	B02-050	Technetium 99 in Soil	TC99_TR_SEP_LSC	1	1	1	1	4
TH	B02-050	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1	1	1	1	4
ΤP	B02-050	Americium 241/Curium in Solids	AMCMISO_IE_PLATE_AEA	1	1	1	1	4
U	B02-050	Uranium, Isotopic in Soil	UISO_PLATE_AEA	1	1	1	1	4
TOTALS				11	11	11	11 1	45

WORK SUMMARY
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R204133-03

METHOD BLANK

Method Blank

1	7267 Melissa C. Mannion	Client/Case no Contract	 SDG H1760
Lab sample id Dept sample id		Client sample id Material/Matrix SAF No	 SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0	0.16	0.26	400	U	н
Carbon 14	14762-75-5	0.210	2.6	4.3	50	U	С
Nickel 63	13981-37-8	0.510	1.0	1.7	30	Ū	NI_L
Total Strontium	SR-RAD	-0.009	0.16	0.34	1.0	U	SR
Technetium 99	14133-76-7	-0.048	0.18	0.61	15	U	TC
Thorium 228	14274-82-9	-0.025	0.049	0.19		Ü	TH
Thorium 230	14269-63-7	0.099	0.099	0.19	1.0	U	TH
Thorium 232	TH-232	0	0.049	0.19	1.0	U	TH
Uranium 233/234	U-233/234	0.058	0.077	0.15	1.0	Ü	U
Uranium 235	15117-96-1	0	0.047	0.18	1.0	Ū	ับ
Uranium 238	U-238	0	0.038	0.15	1.0	Ū	Ū
Neptunium 237	13994-20-2	-0.005	0.022	0.052	1.0	Ū	NP
Plutonium 238	13981-16-3	0.072	0.072	0.27	1.0	Ü	PU
Plutonium 239/240	PU-239/240	0	0.072	0.27	1.0	Ü	PU
Curium 243/244	CM-243/244	-0.027	0.053	0.20	1.0	Ū	TP
Americium 241	14596-10-2	0	0.053	0.20	1.0	บ	ΤP
Potassium 40	13966-00-2	U		0.33	_,_	บ	GAM
Cobalt 60	10198-40-0	U		0.012	0.050	Ü	GAM
Niobium 94	14681-63-1	บ		0.011		Ŭ	GAM
Antimony 125	14234-35-6	U		0.027		ט	GAM
Cesium 134	13967-70-9	U		0.014		Ū	GAM
Cesium 137	10045-97-3	U		0.012	0.10	U	GAM
Radium 226	13982-63-3	Ū		0.024	0.10	U	GAM
Radium 228	15262-20-1	Ū		0.055	0.20	U	GAM
Europium 152	14683-23-9	บ		0.028	0.10	บ	GAM
Europium 154	15585-10-1	บ		0.036	0.10	U	GAM
Europium 155	14391-16-3	บ		0.023	0.10	U U	GAM
Thorium 228	14274-82-9	ับ		0.015	0.10	U	GAM
Thorium 232	TH-232	Ü		0.055		Ω O	GAM

216-Z-11 Ditch Borehole Samples

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R204133-03

BLANK, cont.

Method Blank

SDG <u>7267</u> Contact <u>Melissa C. Mannion</u>	_ Client/Case no _ Contract	 SDG_H1760
Lab sample id R204133-03 Dept sample id 7267-003	Client sample id	SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 235	15117-96-1	Ū		0.041	5	บ	GAM
Uranium 238	U-238	U		1.3		U	GAM
Americium 241	14596-10-2	U		0.012		U	GAM

216-Z-11 Ditch Borehole Samples

QC-BLANK 41865

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R204133-02

LAB CONTROL SAMPLE

Lab Control Sample

SDG <u>7267</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> <u>SDG H1760</u> Case no <u>No. 630</u>
Lab sample id <u>R204133-02</u>	Client sample id <u>Lab Control Sample</u>
Dept sample id <u>7267-002</u>	Material/MatrixSOLID
	SAF No <u>B02-050</u>

ANALYTE	RESULT pCi/g	20 ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %		PROTOCOL LIMITS
Tritium	11.0	0.39	0.27	400	J	н	11.4	0.46	96	83-117	80-120
Carbon 14	8400	84	11	50		С	9700	390	87	86-114	80-120
Nickel 63	222	4.3	1.7	30		NI_L	230	9.2	97	84-116	80-120
Total Strontium	22.3	0.86	0.26	1.0		SR	21.5	0.86	104	82-118	80-120
Technetium 99	111	2.3	0.55	15		TC	109	4.4	102	83-117	80-120
Thorium 230	44.0	4.8	0.49	1.0		TH	40.8	1.6	108	80-120	80-120
Uranium 233/234	17.5	1.6	0.78	1.0		U	18.6	0.74	94	84-116	80-120
Uranium 235	14.1	1.4	0.18	1.0		υ	15.1	0.60	93	83-117	80-120
Uranium 238	19.7	1.7	0.75	1.0		υ	20.2	0.81	98	84-116	80-120
Neptunium 237	21.1	0.94	0.051	1.0		NP	19.9	0.80	106	88-112	80-120
Plutonium 238	20.4	2.7	0.34	1.0		PU	24.6	0.98	83	81-119	80-120
Plutonium 239/240	24.2	3.1	0.34	1.0		PU	26.4	1.1	92	80-120	80-120
Curium 243/244	18.1	1.6	0.21	1.0		TP	19.2	0.77	94	84-116	80-120
Americium 241	18.9	1.6	0.21	1.0		TP	19.1	0.76	99	84-116	80-120
Cobalt 60	0.259	0.023	0.017	0.050		GAM	0.239	0.010	108	71-129	80-120
Cesium 137	0.343	0.021	0.016	0.10		GAM	0.294	0.012	117	71-129	80-120

216-Z-11 Ditch Borehole Samples

QC-LCS 41864

Note: LSC sample was spiked with Cm-244 only.

LAB CONTROL SAMPLES
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R204133-04

B14DJ8

DUPLICATE

SDG <u>7267</u> Client/Case no <u>Hanford</u> SDG_H1760 Contact Melissa C. Mannion Case no No. 630 DUPLICATE ORIGINAL Lab sample id <u>R204133-04</u> Lab sample id <u>R204133-01</u> Client sample id <u>B14DJ8</u> Dept sample id 7267-004 Dept sample id <u>7267-001</u> Location/Matrix 200 West SOLID Received <u>04/30/02</u> Collected/Weight 04/23/02 12:40 1161 g % solids <u>92.4</u> % solids <u>92.4</u> Custody/SAF No B02-050-01 B02-050

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCî/g	RDL pCî/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ PROT
Tritium	0.029	0.10	0.17	400	U	н	-0.027	0.10	0.17	U	-	•
Carbon 14	0	2.3	3.9	50	U	С	-0.751	2.6	4.4	Ü	-	
Nickel 63	0.780	1.1	1.9	30	U	NI_L	-0.062	1.1	1.8	U	-	
Total Strontium	-0.058	0.14	0.30	1.0	U	SR	-0.073	0.14	0.32	U	-	
Technetium 99	0.061	0.18	0.57	15	U	TC	-0.040	0.16	0.57	U	-	
Thorium 228	0.908	0.28	0.17			TH	0.664	0.28	0.18		31	76
Thorium 230	0.567	0.23	0.22	1.0	J	ТН	0.503	0.23	0.17	J	12	92
Thorium 232	0.544	0.23	0.17	1.0	J	TH	0.708	0.28	0.17	J	26	87
Uranium 233/234	0.415	0.19	0.14	1.0	J	υ	0.362	0.15	0.15	j	14	94
Uranium 235	0.068	0.091	0.17	1.0	U	U	0.069	0.092	0.18	U	_	
Uranium 238	0.358	0.15	0.14	1.0	J	U	0.438	0.19	0.15	J	20	92
Neptunium 237	-0.005	0.021	0.050	1.0	U	NP	-0.010	0.031	0.069	IJ	-	
Plutonium 238	0	0.094	0.36	1.0	U	PU	0.077	0.078	0.30	U	-	
Plutonium 239/240	1.08	0.48	0.36	1.0		PU	1.50	0.48	0.30	-	33	80
Curium 243/244	0	0.056	0.11	1.0	U	TP	0.066	0.088	0.17	U	•	
Americium 241	0.140	0.11	0.11	1.0	J	ΤP	0.308	0.18	0,21	J	75	142
Potassium 40	13.4	0.54	0.24			GAM	13.4	0.57	0.24	-	0	33
Cobalt 60	U		0.026	0.050	U	GAM	U		0.024	U	-	
Niobium 94	υ		0.021		U	GAM	U		0.022	Ü	-	
Antimony 125	u		0.048		U	GAM	U		0.050	U	_	
Cesium 134	U		0.032		U	GAM	u		0.033	U	-	
Cesium 137	0.122	0.026	0.029	0.10		GAM	0.124	0.029	0.032	_	2	57
Radium 226	0.516	0.046	0.044	0.10		GAM	0.530	0.049	0.047		3	37
Radium 228	0.828	0.11	0.11	0.20		GAM	0.807	0.11	0.11		3	43
Europium 152	U		0.058	0.10	U	GAM	U		0.060	U	-	1-
Europium 154	U		0.080	0.10	U	GAM	U		0.085	Ü	_	
Europium 155	ü		0.079	0.10	U	GAM	Ü		0.083	U		
Thorium 228	0.705	0.030	0.028	****	-	GAM	0.697	0.031	0.030	•	1	33

216-Z-11 Ditch Borehole Samples

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R204133-04

DUPLICATE, cont.

B14DJ8

SDG	7267		Client/Case no	Hanford SDG_H1760
Contact	Melissa C. Mannion		Case no	No. 630
	DUPLICATE	ORIGINAL		
Lab sample id	R204133-04	Lab sample id <u>R204133-01</u>	Client sample id	B14DJ8
Dept sample id	<u>7267-004</u>	Dept sample id <u>7267-001</u>	Location/Matrix	200 West SOLID
		Received <u>04/30/02</u>	Collected/Weight	04/23/02 12:40 1161 g
% solids	92.4	% solids <u>92.4</u>	Custody/SAF No	802-050-01 B02-050

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Thorium 232	0.828	0.11	0.11			GAM	0.807	0.11	0.11		3	43
Uranium 235	U		0.11		U	GAM	U		0.091	U	-	
Uranium 238	U		3.0		U	GAM	Ų		3.2	U	-	
Americium 241	υ		0.18		U	GAM	U		0.19	U	-	

216-Z-11 Ditch Borehole Samples

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R204133-05

MATRIX SPIKE

B14DJ8

SDG H1760

SDG 7267		Client/Case no <u>Hanford</u>
ontact <u>Melissa C. Mannion</u>		Case no No. 630
MATRIX SPIKE	ORIGINAL	

Lab sample id <u>R204133-05</u>

Dept sample id <u>7267-005</u>

ORIGINAL

Lab sample id <u>R204133-01</u>

Dept sample id <u>7267-001</u>

Received 04/30/03

Received <u>04/30/02</u> % solids <u>92.4</u> Client sample id <u>B14DJ8</u>

Location/Matrix 200 West SOLID

Custody/SAF No <u>B02-050-01</u> <u>802-050</u>

ANALYTE		2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS						REC 3σ LMTS % (TOTAL)	
Tritium	43.2	0.57	0.17	400	JX	Н	46.7	1.9	-0.027	0.10	93 85-115	60-140

216-Z-11 Ditch Borehole Samples

QC-MS#1 41867		

MATRIX SPIKES
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R204133-01

DATA SHEET

B14DJ8

1	7267 Melissa C. Mannion	Client/Case no Contract		SDG_H1760
Lab sample id Dept sample id Received % solids	7267-001 04/30/02	Client sample id Location/Matrix Collected/Weight Custody/SAF No	200 West 04/23/02 12:40 116	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.027	0.10	0.17	400	U	Н
Carbon 14	14762-75-5	-0.751	2.6	4.4	50	U	C
Nickel 63	13981-37-8	-0.062	1.1	1.8	30	U	NI L
Total Strontium	SR-RAD	-0.073	0.14	0.32	1.0	U	sr_
Technetium 99	14133-76-7	-0.040	0.16	0.57	15	U	TC
Thorium 228	14274-82-9	0.664	0.28	0.18			TH
Thorium 230	14269-63-7	0.503	0.23	0.17	1.0	J	TH
Thorium 232	TH-232	0.708	0.28	0.17	1.0	J	TH
Uranium 233/234	U-233/234	0.362	0.15	0.15	1.0	J	U
Uranium 235	15117-96-1	0.069	0.092	0.18	1.0	ប	U
Uranium 238	U-238	0.438	0.19	0.15	1.0	J	Ü
Neptunium 237	13994-20-2	-0.010	0.031	0.069	1.0	Ü	NP
Plutonium 238	13981-16-3	0.077	0.078	0.30	1.0	Ū	PU
Plutonium 239/240	PU-239/240	1.50	0.48	0.30	1.0		PU
Curium 243/244	CM-243/244	0.066	0.088	0.17	1.0	U	TP
Americium 241	14596-10-2	0.308	0.18	0.21	1.0	J	TP
Potassium 40	13966-00-2	13.4	0.57	0.24			GAM
Cobalt 60	10198-40-0	บ		0.024	0.050	U	GAM
Niobium 94	14681-63-1	ซ		0.022		Ü	GAM
Antimony 125	14234-35-6	U		0.050		Ü	GAM
Cesium 134	13967-70-9	U		0.033		Ü	GAM
Cesium 137	10045-97-3	0.124	0.029	0.032	0.10	· ·	GAM
Radium 226	13982-63-3	0.530	0.049	0.047	0.10		GAM
Radium 228	15262-20-1	0.807	0.11	0.11	0.20		GAM
Europium 152	14683-23-9	ט		0.060	0.10	U	GAM
Europium 154	15585-10-1	Ü		0.085	0.10	Ü	GAM
Europium 155	14391-16-3	Ū		0.083	0.10	U	GAM
Thorium 228	14274-82-9	0.697	0.031	0.030	0.20	•	GAM

216-Z-11 Ditch Borehole Samples

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R204133-01

DATA SHEET, cont

B14DJ8

.	7267 Melissa C. Mannion	Client/Case no Contract		SDG_H1760
Lab sample id Dept sample id Received % solids	7267-001 04/30/02	Client sample id Location/Matrix Collected/Weight Custody/SAF No	200 West 04/23/02 12:40 116	SOLID 1 q 050

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Thorium 232	TH-232	0.807	0.11	0.11			GAM
Uranium 235	15117-96-1	U		0.091		บ	GAM
Uranium 238	U-238	U		3.2		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM

216-Z-11 Ditch Borehole Samples

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Test NP Matrix SOLID
SDG 7267
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL

ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1760</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX		Neptu 23				
Preparation batch 7024-	201		<u> </u>			 	 18.88	
B14DJ8	R204133-01		7267-001	U				
BLK (QC ID=41865)	R204133-03		7267-003	υ				
LCS (QC ID=41864)	R204133-02		7267-002	ok				
Duplicate (R204133-01)	R204133-04		7267-004	-	U			

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB Sample	ΞĪĐ	RAW TEST	SUF- FIX	MD/ pCi/g		PREP	DILU-	YIELD		COUNT min		DR1FT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7024-	201	2σ pr	ep er	ror 5	.0 %	Reference	Lab	Notebool	7024	pg.	201	·					
B140J8	R20413	3-01			0.06	9 0.500			62	•	727			57	06/18/02	06/19	SS-043
BLK (QC ID=41865)	R20413	3-03			0.05	0.500			60		728				06/18/02	06/19	SS-047
LCS (QC ID=41864)	R20413	3-02			0.05	0.500			47		727				06/18/02	06/19	SS-044
Ouplicate (R204133-01) (QC ID=41866)	R20413	3-04			0.05	0.500			64		728			57	06/18/02	06/19	ss-048
Nominal values and limi	ts from	metho	d		1.0	0.500			20-10	5	100		<u> </u>	180			

	PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
		CP-060	Soil Preparation, rev 3
		CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
		CP-934	Neptunium from Solids and Water by Extraction
			Chromatography, rev 2
ı			

AVERAGES ± 2 SD	MDA	0.056	±	0.018
FOR 4 SAMPLES	YIELD	58	İ	15

METHOD SUMMARIES
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SAMPLE DELIVERY GROUP H1760

Test <u>PU</u> Matrix <u>SOLID</u>
SDG <u>7267</u>
Contact <u>Melissa C. Mannion</u>

METHOD SUMMARY PLUTONIUM, ISOTOPIC IN SOLIDS ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1760</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Plutonium 238	Plutonium 239/240	
Preparation batch 7024-	201				
814DJ8	R204133-01	7267-001	U	1.50	
BLK (QC ID=41865)	R204133-03	7267-003	U	U	
LCS (QC ID=41864)	R204133-02	7267-002	ok	ok	
Duplicate (R204133-01)	R204133-04	7267-004	- U	ok	
Nominal values and limi 216-2-11 Ditch Borehole		RDLs (pCi/g)	1.0	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE II		SUF- FIX	MAX M pCi/g			DILU-	YIELD					PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7024-20	01 2σ	prep er	ror 5.	.0 %	Reference	Lab	Notebool	7024	pg.	201					
B14DJ8	R204133-	01		0.30	0.500			52		124		51	06/13/02	06/13	SS-042
BLK (QC ID=41865)	R204133-0	03		0.27	0.500			52		123			06/13/02	06/13	SS-044
LCS (QC ID=41864)	R204133-0	02		0.34	0.500			43		123			06/13/02	06/13	SS-043
Duplicate (R204133-01) (QC ID=41866)	R204133-0	04		0.36	0.500			44		108		51	06/13/02	06/13	SS-045
Nominal values and limits	from me	thod		1.0	0.500			20-105	<u> </u>	100	100	 180			

i	PROCEDURES	REFERENCE	PUISO_PLATE_AEA
		CP-060	Soil Preparation, rev 3
		CP-940	Plutonium Separation and Purification, rev 3
		CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD MDA 0.32 ± 0.081 FOR 4 SAMPLES YIELD 48 ± 10

METHOD SUMMARIES
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SAMPLE DELIVERY GROUP H1760

Test	<u>TH</u>	Mat	:ri:	K SOLID
SDG	7267			
Contact	Meli	ssa	c.	Mannion

METHOD SUMMARY THORIUM, ISOTOPIC IN SOIL ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1760</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANC	HET Thoriu	um 230	
Preparation batch 7024-	201				
B14DJ8	R204133-01	7267-	001 0.50	03 J	
BLK (QC ID=41865)	R204133-03	7267-	003 U		
LCS (QC ID=41864)	R204133-02	7267-	002 ok		
Duplicate (R204133-01)	R204133-04	7267-	004 ok	j	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB Sample			SUF- FIX		MDA ALI		EP DIL	J- YIELD			FWHM keV		PREPARED	ANAL -	DETECTOR
Preparation batch 7024-	201 2	σ prep	err	or 5	.0 %	Referer	ce Lat	Noteb	ook 7024	pg.	201		 ,			
B14DJ8	R204133	-01			0.1	7 0.25	0		98		214		51	06/12/02	06/13	SS-047
BLK (QC ID=41865)	R204133	-03			0.19	0.25	0		91		214			06/12/02	06/13	ss-048
LCS (QC ID=41864)	R204133	-02			0.49	0.25	0		86		171			06/12/02	06/12	SS-021
Duplicate (R204133-01) (QC ID=41866)	R204133	-04			0.2	2 0.25	0		94		214		51	06/12/02	06/13	ss-050
Nominal values and limi	ts from m	ethod			1.0	0.25	0		20-10	5	150		180			

ļ	PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
		CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
		CP-905	Thorium in Water and Dissolved Solid Sample
			Using TRU and AG 1x8 Resin, rev 1
		CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD MDA 0.27 ± 0.30

FOR 4 SAMPLES YIELD 92 ± 10

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SAMPLE DELIVERY GROUP H1760

Test <u>TP</u> Matrix <u>SOLID</u>
SDG <u>7267</u>
Contact <u>Melissa C. Mannion</u>

METHOD SUMMARY AMERICIUM 241/CURIUM IN SOLIDS ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1760</u>

RESULTS

CLIENT SAMPLE ID		RAW SUF- TEST FIX PLANCHET	Curium 243/244	Americium 241	
Preparation batch 7024-	201				,
B14DJ8	R204133-01	7267-001	ឋ	0.308 J	
BLK (QC ID=41865)	R204133-03	7267-003	U	U	
LCS (QC ID=41864)	R204133-02	7267-002	ok	ok	
Duplicate (R204133-01)	R204133-04	7267-004	- U	ok J	
Nominal values and limi 216-Z-11 Ditch Borehole		RDLs (pCi/g)	1.0	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX M pCi/g			DILU-	YIELD %				 	PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7024-	201 2 <i>σ</i> p	rep eri	ror 5.	.0 %	Reference	Lab	Notebook	7024	pg.	201					
B14DJ8	R204133-01			0.21	0.500			64	•	168		53	06/15/02	06/15	SS-033
BLK (QC ID=41865)	R204133-03			0.20	0.500			55		169			06/15/02	06/15	SS-042
LCS (QC ID=41864)	R204133-02			0.21	0.500			72		169			06/15/02	06/15	SS-041
Duplicate (R204133-01) (QC ID=41866)	R204133-04			0.11	0.500			87		193		53	06/15/02	06/15	\$S-043
Nominal values and limi	ts from metho	od .		1.0	0.500		<u>.</u>	20-105		100	100	180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-002	Q.C. Preparation, rev 3
	CP-003	Tracing, rev 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-961	Am-Cu Purification, Large Aliquot by Oxalate
		Precipitation, rev 2
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD	MDA	<u>B</u> ±	0.097
FOR 4 SAMPLES	YIELD	_ ±	27

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SAMPLE DELIVERY GROUP H1760

Test U Matrix SOLID
SDG 7267
Contact Melissa C. Mannion

METHOD SUMMARY URANIUM, ISOTOPIC IN SOIL ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG_H1760</u>

RESULTS

	LAB	RAW SUF-	1: Uranium	2: Uranium	3: Uranium	RESU	LT RATIO	S (%)
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX PLANCHET	233/234	235	238	1÷3	2ø 2÷	-3 2σ
Preparation batch 7024-	201						• • • • • • • • • • • • • • • • • • • •	
B14DJ8	R204133-01	7267-001	0.362 J	U	0.438 J	83	50 1	6 22
BLK (QC ID=41865)	R204133-03	7267-003	U	U	U			
LCS (QC ID=41864)	R204133-02	7267-002	ok	ok	ok			
Duplicate (R204133-01)	R204133-04	7267-004	ok J	- U	ok J	116	72 1	9 27
Nominal values and limi	ts from metho	d RDLs (pCi/g)) 1.0	1.0	1.0	100		4
216-Z-11 Ditch Borehole	Samples					Averages 99	1	7

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID		SUF- FIX	MAX ME pCi/g			DILU-	YIELD %				DRIFT KeV		PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7024-	201 2 <i>σ</i> pi	rep er	ror 5.	0 % 1	Reference	Lab	Notebook	7024	pg.	201				•		
B14DJ8	R204133-01			0.18	0.500			97		129			49	06/10/02	06/11	ss-008
BLK (QC ID=41865)	R204133-03			0.18	0.500			93		129				06/10/02	06/11	ss-010
LCS (QC ID=41864)	R204133-02			0.78	0.500			101		129				06/10/02	06/11	SS-009
Duplicate (R204133-01) (QC ID=41866)	R204133-04			0.17	0.500			102		129			49	06/10/02	06/11	SS-011
Nominal values and limit	ts from metho	od		1.0	0.500		,	20-105	 j	100	100	. ,	180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-911	Uranium in Water and Dissolved Sample by
		Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD	MDA	0.33	±	0.60
FOR 4 SAMPLES	YIELD	98	ż	8

METHOD SUMMARIES
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SAMPLE DELIVERY GROUP H1760

Test <u>SR</u> Matrix <u>SOLID</u>
SDG <u>7267</u>
Contact <u>Melissa C. Mannion</u>

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1760</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX		Tota Stront			
Preparation batch 7024-2	201					 	
B14DJ8	R204133-01		7267-001	U			
BLK (QC ID=41865)	R204133-03		7267-003	U			
LCS (QC ID=41864)	R204133-02		7267-002	ok		•	
Duplicate (R204133-01)	R204133-04		7267-004	_	u		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID		SUF- FIX	MDA pCi/g		PREP FAC	DILU- TION	YIELD			 		PREPARED	ANAL~ YZED	DETECTOR
Preparation batch 7024-20	01 2σ	prep er	ror 1	0.0 %	Reference	Lab	Notebool	c 7024	pg.	201					
B14DJ8	R204133-0	1		0.32	1.00			96		100		50	06/12/02	06/12	GRB-217
BLK (QC ID=41865)	R204133-0	3		0.34	1.00			89		100			06/12/02	06/12	GRB-219
LCS (QC ID=41864)	R204133-0	2		0.26	1.00			93		102			06/12/02	06/12	GR8-221
Duplicate (R204133-01) (QC 1D=41866)	R204133-0	4		0.30	1.00			93		100		50	06/12/02	06/12	GRB-220
Nominal values and limits	from met	hod		1.0	1.00			30-105		100	 	180		·	

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-502	Strontium in Solids, rev 4
	CP-519	Strontium Planchet Demounting and Preparation for
		90Y Decontamination, rev 3

AVERAGES ± 2 SD MDA 0.30 ± 0.068
FOR 4 SAMPLES YIELD 93 ± 6

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SAMPLE DELIVERY GROUP H1760

Test	TC	Matrix	SOLID	_
SDG	7267			
Contact	Melis	sa C.	Mannion	

METHOD SUMMARY TECHNETIUM 99 IN SOIL BETA COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1760</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Techno 99		
Preparation batch 7024-2	201					
B14DJ8	R204133-01		7267-001	U		
BLK (QC ID=41865)	R204133-03		7267-003	U		
LCS (QC ID=41864)	R204133-02		7267-002	ok		
Duplicate (R204133-01)	R204133-04		7267-004	-	U	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB Sample	ID	RAW TEST				PREP FAC	DILU-	YIELD %			 DRIFT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7024-	201 2	2ø pr	ер ег	ror 1	0.0 %	Reference	Lab	Notebool	7024	pg.	201					
B14DJ8	R20413	3-01			0.57	1.02			91		50		58	06/15/02	06/20	GRB-217
BLK (QC ID=41865)	R204133	3-03			0.61	1.00			87		50			06/15/02	06/20	GRB-219
LCS (QC ID=41864)	R204133	5-02			0.55	1.00			93		50			06/15/02	06/20	GRB-218
Duplicate (R204133-01) (QC ID=41866)	R204133	5-04			0.57	1.02			85		50		57	06/15/02	06/19	GRB-220
Nominal values and limi	ts from r	netho	d		15	1.00		·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ··	20-10	 5	50	 	180			

l	PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
١		CP-060	Soil Preparation, rev 3
		CP-021	Preparation of Tc-99m Tracer, rev 1
		CP-002	Q.C. Preparation, rev 3
		CP-003	Tracing, rev 3
ı		CP-542	Technetium-99 Purification (Soil) by Extraction
l			Chromatography, rev 1
		CP-008	Heavy Element Electroplating, rev 6
L			

AVERAGES ± 2 SD MDA 0.58 ± 0.050 FOR 4 SAMPLES YIELD 89 ± 7

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-CMS</u>

Version <u>3.06</u>

Report date <u>06/21/02</u>

SAMPLE DELIVERY GROUP #1760

Test	GAM	Matri	X	SOLID
SDG	7267			
Contact	Melis	sa C.		tannion

METHOD SUMMARY GAMMA SCAN GAMMA SPECTROSCOPY

Client <u>Hanford</u> Contract No. 630 Contract SDG H1760

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX		Cobalt	60	Cesium 137	
Preparation batch 7024-2	201	_					
814DJ8	R204133-01		7267-001	U		0.124	
BLK (QC ID=41865)	R204133-03		7267-003	U		U	
LCS (QC ID=41864)	R204133-02		7267-002	ok		ok	
Duplicate (R204133-01)	R204133-04		7267-004	•	U	ok	
LCS (QC ID=41864) Duplicate (R204133-01)	R204133-02 R204133-04		7267-002	ok	U	ok	
nal values and limit 2-11 Ditch Borehole		d RĐ	Ls (pCi/g)	0.050	I	0.10	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID		SUF-	MDA pCi/g			DILU-	YIELD %			DRIFT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7024-	201 2σ μ	rep er	ror 1	5.0 % 8	Reference	Lab	Notebool	7024	pg.	201				:	
B14DJ8	R204133-01	l		0.22	807				-	216		49	06/07/02	06/11	MB,05,00
BLK (QC ID=41865)	R204133-03	;		0.090	807					216			06/07/02	06/11	MB,07,00
LCS (QC ID=41864)	R204133-02	<u>:</u>		0.017	7 807					241			06/07/02	06/10	MB,07,00
Duplicate (R204133-01) (QC ID=41866)	R204133-04	•	٠	0.21	_ 807					241				-	MB,05,00
Nominal values and limi	ts from meth	od		0.050	807					100	 	180			

١	PROCEDURES	REFERENCE	GAMMA_GS
ı		CP-060	Soil Preparation, rev 3
Ì		CP-100	Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD	MDA	0.13	±	0,20
FOR 4 SAMPLES	AIETD		±	

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SAMPLE DELIVERY GROUP H1760

Test C Matrix SOLID
SDG 7267
Contact Melissa C. Mannion

METHOD SUMMARY CARBON 14 IN SOIL LIQUID SCINTILLATION COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1760</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX		Carbo	on 14		
Preparation batch 7024-	201						
B14DJ8	R204133-01		7267-001	U			
BLK (QC ID=41865)	R204133-03		7267-003	U			
LCS (QC ID=41864)	R204133-02		7267-002	ok			
Duplicate (R204133-01)	R204133-04		7267-004	-	U		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE	: ID	RAW TEST				PREP FAC	DILU-	YIELD %			FWHM keV	 	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7024-	201	2σ pr	ep er	ror 1	10.0 %	Reference	Lab	Notebool	7024	pg.	201					·
B14DJ8	R20413	3-01			4.4	0.233			100		100		38	05/30/02	05/31	LSC-006
BLK (QC ID=41865)	R20413	3-03			4.3	0.233			100		100			05/30/02	05/31	LSC-006
LCS (QC ID=41864)	R20413	3-02			11	0.233			100		12			05/30/02	05/31	LSC-006
Duplicate (R204133-01) (QC ID=41866)	R20413	3-04			3.9	0.248			100		100		38	05/30/02	05/31	LSC-006
Nominal values and limi	ts from	metho	d		50	0.233		, ,			50	•	180			

PROCEDURES	REFERENCE	C14_COX_LSC
	CP-060	Soil Preparation, rev 3
	CP-251	Tritium/Carbon-14 Oxidation, rev 3

AVERAGES ± 2 SD MDA 5.9 ± 6.8

FOR 4 SAMPLES YIELD 100 ± 0

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SAMPLE DELIVERY GROUP H1760

Test H Matrix SOLID
SDG 7267
Contact Melissa C. Mannion

METHOD SUMMARY TRITIUM IN SOIL LIQUID SCINTILLATION COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1760</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PI	ANCHET	Trit	îum		
Preparation batch 7024-	201					 	···
814DJ8	R204133-01	72	67-001	U			
BLK (QC ID= 41865)	R204133-03	72	267-003	U			
LCS (QC ID= 41864)	R204133-02	72	67-002	ok	J		
Duplicate (R204133-01)	R204133-04	72	67-004	-	U		
Spike (R204133-01)	R204133-05	72	67-005	ok	JX		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST		MDA Ci/g		PREP FAC	DILU-	YIELD %			FWHM keV	 	PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7024-2	201 2 <i>o</i> pr	rep err	or 10.0	X I	Reference	Lab	Notebool	7024	pg.	201					
B14DJB	R204133-01		().17	20.9			50		120		46	06/07/02	06/08	LSC-005
BLK (QC ID= 41865)	R204133-03		(.26	20.0			33		120			06/07/02	06/08	LSC-005
LCS (QC ID= 41864)	R204133-02		().27	20.0			33		120			06/07/02	06/08	LSC-005
Duplicate (R204133-01) (QC ID= 41866)	R204133-04		().17	20.5			49		120		46	06/07/02	06/08	LSC-005
Spike (R204133-01) (QC ID= 41867)	R204133-05		(.17	20.7			51		120		46	06/07/02	06/08	LSC-005
Nominal values and limit	s from metho	nd .	400)	20.0					25		180			

PROCEDURES	REFERENCE	906.0_H3_LSC
	CP-060	Soil Preparation, rev 3
	CP-216	Tritium in Solid Samples by Azeotropic Distillation, rev 4

AVERAGES ± 2 SD	MDA	0.21	ż	0.10
FOR 5 SAMPLES	YIELD	43	±	19

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SAMPLE DELIVERY GROUP H1760

Test	NI L Matrix SOLID
SDG	7267
Contact	Melissa C. Mannion

METHOD SUMMARY NICKEL 63 IN SOIL LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1760

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	TEST FIX		Nicke	. 63	
Preparation batch 7024-	201					
B14DJ8	R204133-01		7267-001	υ		
BLK (QC ID=41865)	R204133-03		7267-003	υ		
LCS (QC ID=41864)	R204133-02		7267-002	ok		
Duplicate (R204133-01)	R204133-04		7267-004	-	U	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB Sample	ID.	RAW TEST				PREF FAC	P DILU-	YIELD X			 		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7024-2	201	2σ pr	ep er	ror 1	10.0 %	Reference	Lab	Notebool	7024	pg.	201				***************************************	
814DJ8	R20413	33-01			1.8	0.500			91		100		50	06/11/02	06/12	LSC-005
8LK (QC ID=41865)	R20413	3-03			1.7	0.500			94		100			06/11/02	06/12	LSC-005
LCS (QC ID=41864)	R20413	3-02			1.7	0.500			95		100			06/11/02	06/12	LSC-005
Duplicate (R204133-01) (QC ID=41866)	R20413	3-04			1.9	0.500			88		100		50	06/11/02	06/12	LSC-005
Nominal values and limit	s from	metho	xd		30	0.500			30-10	5	50		180			

PROCEDURES	REFERENCE	NI63_LSC
	CP-060	Soil Preparation, rev 3
	CP-431	Nickel-63 Purification, rev 4

AVERAGES ± 2 SD MDA 1.8 ± 0.19
FOR 4 SAMPLES YIELD 92 ± 6

METHOD SUMMARIES
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SAMPLE DELIVERY GROUP H1760

SDG 7267 Contact Melissa C. Mannion

REPORT GUIDE

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG_H1760</u>

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.
 - QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.
- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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SAMPLE DELIVERY GROUP H1760

SDG 7267
Contact Melissa C. Mannion

REPORT GUIDE

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PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SAMPLE DELIVERY GROUP H1760

SDG <u>7267</u> Contact Melissa C. Mannion

REPORT GUIDE

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Contract <u>No. 630</u>
Case no <u>SDG H1760</u>

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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SAMPLE DELIVERY GROUP H1760

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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SAMPLE DELIVERY GROUP H1760

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GUIDE, cont.

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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SAMPLE DELIVERY GROUP H1760

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DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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REPORT GUIDE

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 - 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 - 1. A fixed percentage specified in the protocol.

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DUPLICATE

- 2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.
- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 - The errors of the two RESULTs, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits

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SDG <u>7267</u> Contact <u>Melissa C. Mannion</u> SAMPLE DELIVERY GROUP H1760

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Case no	SDG	H1760	

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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SAMPLE DELIVERY GROUP H1760

SDG 7267
Contact Melissa C. Mannion

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Case no	SDG_H1760

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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Case no SDG H1760

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * 'If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Prepareation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

REPORT GUIDES
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SUMMARY DATA SECTION
Page 39

SAMPLE DELIVERY GROUP H1760

SDG 7267
Contact Melissa C. Mannion

GUIDE, cont.

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1760</u>

METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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SAMPLE DELIVERY GROUP H1760

SDG 7267
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hanford
Contract	No. 630
Case no	SDG_H1760

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

REPORT GUIDES
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SUMMARY DATA SECTION
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Bechtel Hanford Inc.	CI	HAIN OF CUST	ODY/S	SAMPLE	ANALY	SIS	REQUEST		B02	-050-01	Page -2	* 2
Collector R. Fahlberg/R. Nielson	Compa	iny Contact ne Jacques	Telepho 372-9	ne No.			Project Coordina TRENT, SJ	tor P	rice Code	8N	Data Turn	12 W.C.Z
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Ice Chest No. & RC - 96 - 081		.ogbook No. 1517-		COA B20CW56	Method of Shipment Federal Express							
Shipped To	Offsite	Property No.	Ø2.	0211			Bill of Lading/A	ir Bill No.	SPC			
POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive Potential TIL TO BIYOL7		Preservation	P. L	P P P	None	Non						
Special Handling and/or Storage		Type of Container	**	**	P	aG						
_		No. of Container(s)			1	1						
NONE		Volume	250mL R3A34-1	120mL	1000mL هاره ۴۰اد-	120m 62	L (2) 14 16 102	-				
Sample analysi	s		See item (17) Special E Instructions	n TPH-Diesel	See item (7) in Special 6 Instructions.	See item Speci Instruct	Orin ial ₹	700-11				
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SAMPLE RECEIPT CHECKLIST

				RECEIPT				
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Form SCP-01.2, 09-25-00 Previous editions of this form may be used. "50 years of quality nuclear services"



Lionville Laboratory, Inc. VOA ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1760

DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS		
B14DJ8	001	- — s	02LVG106	04/23/02	N/A	05/04/02		
B14DJ8	001 MS	s	02LVG106	04/23/02	N/A	05/04/02		
B14DJ8	001 MSD	s	02LVG106	04/23/02	N/A	05/04/02		
LAB QC:								
VBLKVB	MB1	S	02LVG106	N/A	N/A	05/04/02		
VBLKVB	MB1 BS	S	02LVG106	N/A	N/A	05/04/02		



Client: TNU-HANFORD B02-050

LVL#: 0204L529

SDG/SAF #: H1760/B02-050

W.O. #: 11343-606-001-9999-00 Date Received: 04-30-2002

GC/MS VOLATILE

One (1) soil sample was collected on 04-23-2002.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for client specified volatile target compounds on 05-04-2002.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- All results presented in this report are derived from samples that met LvLI's sample acceptance
 policy with the exception of cooler temperature, which has been recorded on the chain of
 custody.
- 2. The required analysis holding time was met.
- 3. A non-target compound was detected in the method blank.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA OC limits.
- 6. All blank spike recoveries were within EPA QC limits.
- 7. Internal standard area and retention time criteria were met.
- 8. A spectral search was performed for the compounds Tetrahydrofuran; however, this compound was not detected in the sample.
- 9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor

Date

President

Lionville Laboratory Incorporated

OWSA

som\group\data\voa\tnu-hanford\0204-529.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 3 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- 1 = interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions
		and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.



TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

- MP Missed Peak: manually added peak not found by automatic quantitation program.
- PA Peak Assignment: quantitation report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- Pl Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



L-WI-035/a-mi-10/00

RFW Batch Number: 0204L529 Client: TNUHANFORD B02-050 H1760 Work Order: 11343606001 Page: la

	Cust ID:	B14DJ8	3	B14DJ8	:	B14DJ8		VBLKVB		VBLKVB BS		
Sample RFW#:		001		001 MS		001 MSD	001 MSD		02LVG106-MB1		в1	
Information	Matrix:	SOIL		SOIL	SOIL			SOIL		SOIL		
	D.F.:	1.0	0	0.94	3	1.0	6	1.0	0	1.0	0	
	Units:	ug/I	g	ug/K	g	ug/K	g	ug/K	g	ug/K	g	
	Toluene-d8	102	%	103	8	99	*	97	8	97	8	
Surrogate Br	romofluorobenzene	100	¥	101	ક	99	ક	97	옿	99	웉	
Recovery 1,2-I	Dichloroethane-d4	97	ક્ર	96	*	98	윧	92	ક	100	용	
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Chloromethane		11	Ü	10	U	11	Ū	10	Ū	10	U	
Bromomethane		11	ט		U	11	-	10	U	10	Ū	
Vinyl Chloride			Ü	5	U	6	Ū	5	U	5	Ü	
Chloroethane		11	U	10	Ū	11	U	10	Ū	10	U	
	de	8	_	10	_	11	_	5	Ū	1	J	
Acetone		6	J	9	J	8	J	10	U	10	U 	
Carbon Disulfide		6	Ū	5	U	6	U	5	U	5	Ū	
1,1-Dichloroether	ne		U	85_	ક	83	ક	5	U	83	ક	
1,1-Dichloroethar	ne	6	U	5	Ü	6	Ü	5	U	5	U	
	ne (total)	6	U	5	U	6	Ū	5	U	5	U	
Chloroform		6	U	5	U	6	Ū	5	Ū	5	Ū	
1,2-Dichloroethar	ne	6	U	5	U	6	U	5	U	5	U	
2-Butanone		11	U	10	Ū	11	U	10	U	10	Ū	
1,1,1-Trichloroet	thane		Ū	5	U	6	U	5	U	5	U	
Carbon Tetrachlo	ride	3	U	. 3	Ū	3	U	3	U	3	Ü	
Bromodichlorometh	hane	6	U	5	Ū	6	U	5	U	5	U	
1,2-Dichloropropa	ane	6	U	5	U	6	U	5	U	5	U	
cis-1,3-Dichloro	propene	6	U	5	U	6	U	5	U	5	U	
Trichloroethene_		6	U	95	*	97	왐	5	U	97	ક	
Dibromochloromethane		6	U	5	Ų	6	U	5	U	5	U	
1,1,2-Trichloroethane		6	U	5	U	6	U	5	U	5	U	
Benzene		6	U	93	뫙	95	ક	5	U	97	왐	
Trans-1,3-Dichloropropene		6	U	5	U	6	U	5	U	5	U	
Bromoform		6	Ū	5	U	6	U	5	U	5	U	
4-Methyl-2-pentanone		11	Ü	10	U	11	U	10	U	10	U	
2-Hexanone		11	U	10	U	11	U	10	U	10	U	
Tetrachloroethen	€	6	U	5	U	6	U	5	Ū	5	Ū	
1,1,2,2-Tetrachlo	oroethane	6	U	5	U	6	U	5	U	5	Ū	
Toluene		6	U	97	용	97	옿	5	U	101	ક	

^{*=} Outside of EPA CLP QC limits.

RFW Batch Number: 0204	L529 Clie	nt: TNUE	LANFORD	B02-050	H176	0 Work C	rde	r: 11343606	001	Page: 1b	1	
	Cust ID:	B14DJ8	l	B14DJ8		B14DJ8	1	VBLKVB		VBLKVB BS		
	RFW#:	001	L	001 MS		001 MSD	•	02LVG106-M	B1	02LVG106-M	B 1	
Chlorobenzene		6	U	95	*	94	*	5	Ū	102		
Ethylbenzene		6	Ū	5	Ū	6	U	5	Ū	5	U	
Styrene		6	U	5	U	6	U	5	U	5	U	
Xylene (total)		6	U	5	Ū	6	U	5	U	5	U	
Trichlorofluoromethane		6	U	5	U	6	U	5	U	5	ט	
Cyclohexanone		55	ប	50	U	55	U	50	Ü	50	Ū	
1,2,4-Trimethylbenzene		6	U	5	U	6	U	5	U	5	U	

^{*=} Outside of EPA CLP QC limits.

1E

VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.	
1			ĺ
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	B14DJ8
Lab Name: <u>Lionville Labs, Inc.</u> Contract: ;	11343606001
Lab Code: <u>Lionvi</u> Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID: 0204L529-001
Sample wt/vol: 5.00 (g/mL) G	Lab File ID: <u>q050412</u>
Level: (low/med) <u>LOW</u>	Date Received: 04/30/02
Moisture: not dec7	Date Analyzed: 05/04/02
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 1.00
	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>ug/Kg</u>

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
		********	*=====	*********		
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1E VOLATILE ORGANICS ANALYSIS SHEET

EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUND	S VBLKVB
Lab Name: Lionville Labs, Inc. Contract: 113	· · · · · · · · · · · · · · · · · · ·
Lab Code: <u>Lionvi</u> Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) SOIL	Lab Sample ID: 02LVG106-MB1
Sample wt/vol: 5.00 (g/mL) G	Lab File ID: q050407
Level: (low/med) <u>LOW</u>	Date Received: <u>05/04/02</u>
% Moisture: not dec0	Date Analyzed: 05/04/02
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 1.00
¥ ==·	CENTRATION UNITS: /L or ug/Kg) <u>ug/Kg</u>

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
		======	=======================================	
1.	SILOXANE	19.648	20	J
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Lionville Laboratory Use Only

Custody Transfer Record/Lab Work Request Page of

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

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MATRIX		T			Ma	trix					·y		__		Lionvi	ile La	borate	ory Us	e Onl	_	<u> </u>			
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UXUTL VUY

Bechtel Hanfor	d Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST B02-050-01 Page 1 of 2										of 2				
Collector R. Fahlberg/R. Nielson			ipany Contact vane Jacques		Telephor 372-9				<u></u> .	Project C TRENT,	oordinator Sj	Pa	Price Code 8N		Data Turnaround	
Project Designation 216-Z-11 Ditch Borehole Samp	ples		pling Location 00 West							SAF No. B02-050		Ai	ir Quality		45 Days	
Ice Chest No. SRA -	02-008	Fiel E	d Logbook No. L-1517-	ck No. COA Method of Shipment B20CW5674C Federal Express								•	- · · · · ·			
Shipped So TMA/RECRA		Off	ite Property N	· AC	カァバ	Bill of Lading/Air Bill No							E OSPC			
POSSIBLE SAMPLE HAZAI	RDS/REMARKS	•		' /									T			
Radioactive Potential Tie TO BIYDLT			Preser	vation	Cool 4C	Cool 4	4C	Cool 4C	Cool	4C Co	NAC Co	al 4C	Coal 4C	Cool 4C	Coul 4C	Coul 4C
Tie 7 Special Handling and/or S		4	Type of C	Container	вG	aG		aG	P	-	G	G	aG	aG	aG	aG
	•		No. of Co	ntainer(s)	1	1		1	1		1	1	1	1	1	1
Coc	<i>ا</i> ل		Volu	imė	120mL	250m	пL	120mL	1000	mL 12	OrnL 25	0mL	120mL	250mL	250mL	250mL
SAMPLE ANALYSIS					See item (1) in Special Instructions.	See item (Special Instructi	ial	Chromium Hex - 7196	See item Speci Instruct	D.	szine - PCB 385	s - 8082	Pesticides - 3081	Rerbicides - 8150A	See item (4) in Special Instructions.	Alcohols, Glycols, & Keiones - 8015 (Methanol)
Sample No.	Matrix *	Sample Da	e Sam	ple Time												
B14DJ8	SOIL	4-23-	02 1	240	Χ	X	•	χ	χ	/	Y	X	Х	X	χ	Χ
																``
					ļ											
																
CHAIN OF POSSESSIO	N	et m_	int Names			<u> </u>			İ				<u> </u>		<u> </u>	
Relinquished By/Removed From	Date/Time 6			D:	ite/Time			IAL INSTR		NS						Matrix *
RF-CLO PACEL Reliaquished By Removed From Sel 14 372	Date/Time (S)	Post	tored in 1	2302	1615 4.29	991	Mercu (2) IC	ry (TCLP) - 13 P Metals - 601	31 <i>1/747</i> 0 IOA (Sup	ertrace) (Ars	nic Barium (Cadmiur	ium, Chromium n, Chromium, I	ead Selenium	Silvert	S=Soil SB=Sediment SO=Solid SI=Sludge W = Water
Reliaquished Burkemoved From	Dete/Time	Received By/S	LYUX	<u></u>	ate/Time		Molyb (3) IC (4) V(denum, Nickei Anions - 300. DA - 8260A (T	l, Vanadi: 0 (Fluori (CL); VC	um, Zinc}; M de, Nitrate, S A - 8260A (A	lercury - 7470 ulfate}: Amm	- (CV) pnia - 35	pper, Magnesiu 50.3; NO2/NO3 2nofluorometha	- 353 1: Sulfic	lee . 0030	O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue
Relinquished By/Removed From Date/Time Received By/Stored In					Oユ / ○○ ste/Time	,	LA. AUG	I-On) (Tetrah) Personnel retinguist	l not av	ailable to	3728					W=Wipe L=Liquid V=Vegstation X=Other
Relinquished By/Removed From Date/Time Received By/Stored In Date					ate/Time			Ref#	On	es from th	SQ					
LABORATORY Received By SECTION		- ··· • · · · · · · · · · · · · · · · ·			Ti	ile				_				1	Date/Time	<u> </u>
FINAL SAMPLE Disposal Med DISPOSITION	thod				•			Dispo	sed By					1	Date/Time	···

Bechtel Hanford Inc.	CI	HAIN OF CUST	ODY/S	AMPLE	AN	ALY	YSIS	R	EQUEST		B02	2-050-01	Page 2	of 2
Collector R. Fahlberg/R. Nielson		uny Contact ne Jacques	Telephor 372-9						oject Coordinator ENT, SJ	Pri	ce Code	8N	Data Tur	narowid
Project Designation 216-Z-11 Ditch Borehole Samples		ing Location West							.F No. 2-050	Air	Air Quality 🗆 4		45 I	Days
ice Chest No. ERC 62-008		EL-1517- B20CW5674C							Method of Shipment Federal Express					
Shipped To TMARECRA	Offsite	e Property No. AD70088						Bill of Lading/Air Bill No. C OSPC						
Possib le sam ple hazards/remarks		7			1	Ğ	, 1		1 .					
Radioactive Potential		Preservation	Cool 4C	Cool 4C	TX.	24.0	N	HEF 4	4.02					
TIETO BI4DL7 Special Handling and/or Storage		Type of Container	a G	aG		Ì	ia(G						
		No. of Container(s)	1	1		t l	1	1 .						·
Cool		Volume	250mL	120mL	1 1	0mL		OmL						
			R)~ 4-16			4-6-			· + to 02_			<u> </u>		
Sample analysis			See item (17) Special 5 Instructions.	TPH-Diesel Range - WIPH-D; TPH-Gasoline Range - WTPH-G	Sa	m (F) in ecial 6 ections.	See i en Stee Lust tu	ecial 7						
Sample No. Matrix * S	ample Date	Sample Time												
B14DJ8 SOIL U	43-0	2 1240	Х	X	>	1	λ	(
	ou . m .	1 N	<u> </u>		<u> </u>		<u> </u>					<u> </u>		
Reinquished By/Removed From Date/Time (6,7 Re Reinquished By/Removed From Date/Time (6,7 Re Date/Time)	Zr i	red ly Di	ate/Time	See C RINY S(1) S C(2) Tribu	OC cor -(b-02- cmi-VC tyl phos	nments - DA - 827 sphate}		CL); S	emi-VOA 8270A (1 -fimony - 25 sium-134, Cesium-13					Matrix * s=soil ss=soimed so=solid si=sludgs w = water
Relinational By Report of Flore Poster Time De Concernie	Fived By/Sta	T-60 9	ale Time 4	2900 Nope	man 15	5, Niob 137, Nio	iun 0 4, kel 63;	, Pada Buom	um 226, Redium 226) tium 89,99 — Tomi 6r m-241/Curium 244 (.	, îsotopic , Technoti	Thorium (In an-99, Tridu	orium-232); G n - 113, Isompi	urbon 14.	O=Oil A=Air DS=Druu Sulide
Religioushed By/Removed From Date/Time Re	ceived Buffilo		ate/Time	(Add		urium-2						2-		DL=Drum Liquids T=Tisque WI=Wipe L=Liquid
Relinquished By/Removed From Date/Time Received By/Stored In Date/Time						Person relinq	nnel n uişh,sı	ot av ampi	ailable to	+		·		V≠Vegetation X=Other
Relinquished By/Removed From Date/Time Re	ceived By/Sto	red in D	ate/Time			Ref#	<i>]H</i>	on	es from the 3728					
LABORATORY Received By SECTION			Т	itle]	Date/Time	
FINAL SAMPLE Disposal Method DISPOSITION						Dispo	sed By	,		- · · · · · -			Date/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD Purchase Order/Project:

DATE: 4.30.0ン

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG #: 02041529

<u>].</u>	ALL ENTRIES MARKED "NO" MUST BE I Custody seals on coolers or shipping	QV es	□ No	□ N/A	☐ see Comment #
٦.	container intact, signed and dated?	•		2	
2.	Outside of coolers or shipping containers are free from damage?	□√ es	□ №	□ N/A	☐ see Comment :
3.	Airbill # recorded?	G/Yes	□ No	□ N/A	☐ see Comment (
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as	D.Yes	. DNo	□ N/A	☐ see Comment
	applicable)? (paperwork sealed in plastic bag and taped to inside lid)	-/			
5.	Sample containers are intact?	□ Yes/	□ No	□ N/A	see Comment &
6.	Custody seals on sample containers intact, signed and dated?	D. Ves	□ No	□ N/A	see Comment #
7.	All samples on coc received?	DX es	□ No	D N/A	□ see Comment #
8.	All sample label information matches coc?	هالات	□ No	□ N/A	D see Comment
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	₽Yes	□ No	□ N/A	See Comment
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	T Yes	□ No	□ N/A	see Comment
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No .	DMA	See Comment i
12.	coc signed and dated?	√Z Yes	□ No	□ N/A	See Comment
13.	coc faxed or emailed to client?	□ Yes	□ No	□ N/A	☐ see Comment
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	see Comment

Cooler # / temp and Comments:

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:



Lionville Laboratory, Inc. BNA ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1760

DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14DJ8	001	s	02LE0473	04/23/02	05/01/02	05/17/02
B14DJ8	001 MS	S	02LE0473	04/23/02	05/01/02	05/17/02
B14DJ8	001 MS D	S	02LE0473	04/23/02	05/01/02	05/17/02
LAB QC:						
		_		4-		
SBLKUF	MB1	S	02LE0473	N/A	05/01/02	05/17/02
SBLKUF	MB1 BS	S	02LE0473	N/A	05/01/02	05/17/02



Client: TNU-HANFORD B02-050

LVL #: 0204L529

SDG/SAF #: H1760/B02-050

W.O. #: 11343-606-001-9999-00 Date Received: 04-30-2002

SEMIVOLATILE

One (1) soil sample was collected on 04-23-2002.

The sample and its associated QC samples were extracted on 05-01-2002 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 05-17-2002.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy with the exception of cooler temperature, which has been recorded on the chain of custody.
- 2. The sample was extracted and analyzed within required holding time.
- 3. A non-target compound was detected in the sample.
- 4. One (1) of thirty (30) surrogate recoveries was outside EPA QC limits. However, EPA CLP surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).
- 5. All blank spike recoveries were within EPA QC limits.
- 6. Ten (10) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
- 7. All blank spike recoveries were within EPA QC limits.
- 8. Internal standard area and retention time criteria were met.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor

President

Lionville Laboratory Incorporated

som\gorup\data\bna\tnu-hanford-0204-529.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 3 pages.

GLOSSARY OF BNA DATA

DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 31.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions
		and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.



TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- MP Missed Peak: manually added peak not found by automatic quan program.
- PA Peak Assignment: quan report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

RFW Batch Number: 0204L529 Client: TNUHANFORD B02-050 H1760 Work Order: 11343606001 Page: 1a

	Cust ID:	B14DJ8	3	B14DJ8		B14DJ8		SBLKUF		SBLKUF BS	
Sample	RFW#:	001	L	001 MS		001 MSD		02LE0473-M	В1	02LE0473-MB1	
Information		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.0	00	1.0	0	1.00	0	1.0	0	1.00	
	Units:	ug/F	ζα	ug/K		ug/Kg		ug/K	_	ug/Kg	
		J	-	3,	-	-3,3	•	-5,	_	-3,3	
	Nitrobenzene-d5	94	*	91	옿	101	*	81	*	86 %	
Surrogate	2-Fluorobiphenyl	88	ક્ષ	89	*	98	ሄ	79	ક	78 %	:
Recovery	p-Terphenyl-d14	96	ક્ષ	104	ક્ર	108	¥	105	ક	89 %	;
	Phenol-d5	101	₽	99	¥	112	¥	83	¥	87 %	•
	2-Fluorophenol	95	*	90	¥	101	옿	74	옿	80 %	i
	2,4,6-Tribromophenol	108	ક્ષ	120	ક્ર	127 *		104	ક્ષ	101 %	
=======	******		==fl							======================================	l======f1
Phenol	-athrillathan	330	Ū	97 *	ક	111 *		330	U	88 %	1
bis(2-Chlore	Security Securer	330	Ū	330	Ū	330	U	330	U	330 U	Ī
2-Chloropher	nol	330	Ü	97	ક	110 *	ક	330	U	87 %	•
1,3-Dichlor	obenzene	330	U	330	U		U	330	IJ	330 U	Ī
1,4-Dichlor	obenzene	330	U	79	ક	89	ł	330	U	71 %	•
1,2-Dichlor	obenzene	330	U		U	330	Ū	330	U	330 U	Ţ
2-Methylphe	nol	330	U		U	330	U	330	U	330 U	Ī
2,2'-oxybis	(1-Chloropropane)	330	U		U		U	330	U	330 U	Ţ
3- and/or 4-	-Methylphenol	330	U	330	U	330	U	330	U	330 🖰	J
N-Nitroso-D	i-n-propylamine	330	U	93	f	108	と	330	U	89 %	
Hexachloroet	thane	330	U	330	Ū	330	U	330	U	330 U	Ī
Nitrobenzen	e	330	U	330	U	330	U	330	U	330 U	ī
Isophorone_		330	Ų	330	U	330	U	330	U	330 U	Ţ
2-Nitrophen	ol	330	U	330	Ū	330	U	330	U	330 0	J
2,4-Dimethy	lphenol	330	U	330		330	Ũ	330	U	330 T	J
bis(2-Chlore	oethoxy) methane		U	330	U	330	U	330	Ū	330 T	J
2,4-Dichlor	ophenol	330	U	330	-	330	Ū	330	U	330 U	J
1,2,4-Trich	lorobenzene	330	U	81	ક	87	ક્ષ	330	U	75 %	•
		330	Ü	330	U	330	U	330	Ü	330 T	J
4-Chloroani	line	330	U	330	U	330	U	330	U	330 U	Ī
Hexachlorob	utadiene	330	Ü	330	U	330	U	330	U	330 U	J
4-Chloro-3-	methylphenol	330	U	110 *	¥	122 *	ક્ર	330	U	102 %	;
2-Methylnaph	hthalene	330	U	330	U	330	U	330	Ų	330 🗓	I
Hexachloroc	yclopentadiene	330	U	330		330	Ū	330	U	330 T	J
2,4,6-Trich	lorophenol	330	U	330	U	330	U	330	U	330 T	J
2,4,5-Trich	lorophenol	830	U	830	U	830	U	830	U	830 T	J

^{*=} Outside of EPA CLP QC limits.



Report Date: 05/23/02 16:50

Cust ID:	814008		B14D08		BIADJ8		SBLKUF		SBLKUF BS		
RFW#:	001		001 MS		001 MSD	ı	02LE0473-M	в1	02LE0473-M	B 1	
2-Chloronaphthalene	330	U	330	U	330	U	330	U	330	U	
2-Nitroaniline	830	U	830	U	830	U	830	U	830	Ū	
Dimethylphthalate	330	Ü	330	U	330	U	330	U	330	Ü	
Acenaphthylene	330	U	330	U	330	Ū	330	Ū	330	Ū	
2,6-Dinitrotoluene	330	U	330	U	330	U	330	ซ	330	U	
3-Nitroaniline	830	U	830	U	830	U	830	Ü	830	U	
Acenaphthene	330	U	85	ક્ષ	92	¥	330	U	79	*	
Acenaphthene 2,4-Dinitrophenol	830	U	830	Ū	830	U	830	U	830	U	
4-Nitrophenol	830	U	115 *	¥	123 *	*	830	U	111	*	
Dibenzofuran	330	U	330	U	330	U	330	U	330	U	
2,4-Dinitrotoluene	330	U	94 *	¥	99 *	ક	330	U	86	ક	
Diethylphthalate	330	U	330	Ū	330	U	330	Ū	330	U	
4-Chlorophenyl-phenylether	330	U	330	Ū	330	U	330	U	330	U	
Fluorene4-Nitroaniline	330	Ū	330	U	330	U	330	U	330	U	
4-Nitroaniline	830	Ū	830	Ū	830	Ū	830	U	830	Ū	
4,6-Dinitro-2-methylphenol	830	U	830	Ū	830	U	830	U	830	U	
N-Nitrosodiphenylamine (1)	330	U	330	U	330	U	330	Ū	330	U	
4-Bromophenyl-phenylether	330	U	330	Ū	330	U	330	Ū	330	Ū	
Hexachlorobenzene	330	U	330	U	330	U	330	U	330	Ü	
Pentachlorophenol	830	Ū	105	*	114 *	*	830	U	99	*	
Phenanthrene		Ū	330	U	330	U	330	U	330	U	
Anthracene	330	-	330	U	330		330	U	330	U	
Carbazole	330	U	330	U	330	U	330	U	330	U	
Di-n-Butylphthalate	330	_		U	330	U	330	U	330	U	
Fluoranthene	330		330	U	330	U	330	U	330	U	
Pyrene	330		99	¥	102	왐	330	U	86	*	
Butylbenzylphthalate	330		330	U	330		330	U	330	U	
3,3'-Dichlorobenzidine	330			U	330	_	330	U	330	Ū	
Benzo(a)anthracene			330	U	330		330	Ū	330	Ū	
Chrysene	330	_	330	U	330	_	330	U	330	U	
bis(2-Ethylhexyl)phthalate	330		330	U	330		330	U	17	J	
Di-n-Octyl phthalate	330	U	330	U		Ū	330	Ū	330	Ū	
Benzo(b)fluoranthene	330	_	330	U	330	-	330	Ū	330	U	
Benzo(k) fluoranthene	330	Ū	330	U	330		330	Ū	330	Ū	
Benzo(a)pyrene	330	-	330	U	330	U	330	U	330	U	
Indeno(1,2,3-cd)pyrene	330			U		U	330	U	330	U	
Dibenzo(a,h)anthracene	330		330	บ		U	330	U	330	U	
Benzo(g,h,i)perylene	330		330	U	330	U	330	U	330	U	
Tributylphosphate	330	U	330	U	330	U	330	Ū	330	U	

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B14DJ8		

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B02-050 H1760

Matrix: (soil/water) SOIL Lab Sample ID: 0204L529-001

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A051711}$

Level: (low/med) LOW Date Received: 04/30/02

% Moisture: 100 decanted: (Y/N) Date Extracted: 05/01/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	**=====================================		==========	
1.	UNKNOWN	8.323	300	JВ
				ii

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKUF		

Lab Name: Lionville Labs. Inc. Work Order: 11343606001

Client: TNUHANFORD B02-050 H1760

Matrix: (soil/water) SOIL Lab Sample ID: 02LE0473-MB1

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A051709}$

Level: (low/med) <u>LOW</u> Date Received: <u>05/01/02</u>

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 05/01/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=======================================		**=====	******	
1.	UNKNOWN	8.323	300	J

			302-050			Refriger	rator #		A	5	5	<u>5</u>	E 5	5	<u>ج</u> ح	H 5		<u>I</u>	<u>ح</u> 2	<u>۲</u>	5		
st. Final Proj	. Samp	ing Date				#/Type (Container	Liquid				*				•4/	1.465 ± 1.	i. 0.7	ഹ	200			
			- 001-9999-00	<u>) </u>				11/2 11/2		(c.)	IAG-	FAU-	JHC	/A0	116	(1)45 <u>.</u> 200	945.44 Page 4		V =		AG	(T)	
- ·			05			Volume		L. 2017 W.A.	250	250	250	250	120	250	120	251		/ao	(, ,	250	<i>(2</i> 0	T	
c 3Pa		~ ~		<u> </u>		Preserv	ratives				ANIC	10 N/2 A 1 N/2 A	-	AICO!		مسير INC)PG			ا ا درسا	* **	ب	ad was: uter N Outer N ample r N esent
ste Rec'd	4-3	0-02	Date Due	<u> </u>				- > _	VOA	ANA ANA	ANIC BCB BCB BCB	Herb	ग	KeT	HP.	Metal Metal	중	Tolo	AN;	MET S	March 1		
ATRIX DDES: - Soll - Sediment - Solid	Lab 1D	, CIA	ent ID/Description	Chx (i	iC men /)	Matrix	Date Collected	Time Collected	X4790	×5290	0/tB	OHBGN +				MET ()	Ť		ZMORED	ITUP -	2 HYEN	RCRATEW	
- Siudge - Water - Oil	001	B14D	78	MS V	V/	S	4-23-02	1240		\overline{I}	1	j	I	1	(1		1	J	1	1		or 17
Air	200	1.0		V	1	L	*									3					15045	J	
Solids Dram							Ů.		ر فاخه														
Liquida EP/TCLP											ļ								181	Als / S /			
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	-			+	-	<u> </u>	- X -	Su	La	lch	nan				1 4/3 4/3			3 30 30 30 3	3 Th	100		1	
ecial instruct	tions:	SAF #	B05-020				NS.	-				. M	. M	o, N.	V,Z	n F	<u> </u>		lie Lab				
L Final Proj. Sampling Date Oject Contact/Phone 8 Volume Volume Volume Volume Sold World G. A. M. A.	Service Servic	iter N Out N																					
	a //-	by O	Date Time	by		OSITE	Received by	ORIG	HN	AL.		San	nples L C Reco	abels a	nd _		Property 5) Rece	Preser	or N thin	S C U	ample OC Red Ipon Sar Cooler	y or cord Pro	984 9C

UXUTL VAT

Bechtel Hanford	d Inc.	C	HAIN OF CUST	ODY/S	AMPL	E ANALY	YSIS	REQUEST	7	B02	2-050-01	Page 1	of <u>2</u>
Collector R. Fahlberg/R. Nielson		Comp	any Contact ine Jacques	Telephor 372-90	ne No.			Project Coordi TRENT, SJ	nator	rice Code	8N	Data Tur	
Project Designation 216-Z-11 Ditch Borehole Samp	oles		ing Location West					SAF No. B02-050	A	ir Quality	· 🗆	45 1	Days
Ice Chest No.	800-50	Field I	Logbook No. 1517-		COA Method of Shipment B20CW5674C Federal Express								
Shipped To TMARECRA			e Property No. A	カァド	HB	8		Bill of Lading	Air Bill No	05	pc		
POSSIBLE SAMPLE HAZAR Radioactive Potent			, , ,	Cool 4C	Cool 4C	Cool 4C	Cool	4C Coal 4C	Cool 4C	Cool 4C	Coal 4C	Cool 4C	Cool 4C
Radioactive FT 10 7	0 B14D	L7	Preservation	aG	aG	a.G	P	a-G	aG	aG	aG	a-G	aG
Special Handling and/or S	_		Type of Container	1	1	1	i		1	1	1	1	1
1 0	_1		No. of Container(s)						ļ				250mL
Coc			Volume	120mL	250mL	120mL	1000	mL 120mL	250mL	120mL	250mL	250mL	250mL
	SAMPLE ANAL	ysis		See Hern (1) in Special Instructions.	Special	Hex - 7196	See item Spec Instruc	zal D1385	PCBs - 8087	Pesticides - 8081	Herbicides - 8150A	See item (4) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015 (Methanol)
Sample No.	Matrix *	Sample Date	Sample Time										
B14DJ8	SOIL	4-23-0	1240	Χ	X	Χ	λ	/ X	Х	Х	X	Х	Χ
									<u> </u>		<u> </u>		
					-		 		ļ			 	
							 						-
CHAIN OF POSSESSIO	<u> </u>	Sign/Pri	nt Names	<u> </u>	SP	ECIAL INSTR	UCTIO	L DNS	<u> </u>		<u>.l</u>		Matrix *
Relinquished By/Removed From	Date/Time	_		ete/Time		e COC comments					read		5-6ai) 28-Seilmat
RF-CO PACIO Rejinquished Byrremoved From A 14 3 72 Rejinquished Byrrempor From	8 4.291	Rest ! Retailed By the file Received By (Ste		ate/Time	IC PART	ercury (TCLP) - 1) ICP Metals - 60 P Metals - 6010A	311/7470 10A (Sur (Supertr	1311/6010 {Arsenic) pertrace) {Arsenic, E ace Add-On) {Beryl ium, Zinc}; Mercury	arium, Cadm ium, Boron, (ium, Chromium, Copper, Magnes	Lead, Selenius	n, Silver);	SO-Selid Si-Sludge W = Water O-Oil A-Air
Reliaguished BarRemoved From	Dete/Time 30- 02 / 005		erry 4:50	Pate/Time	(4)) VOA - 8260A ((Add-On) (Tetral:	TCL); V Iyorofura	٠ 🔀	; Ammonia - n) (Trichloro	350.3; NO2/NO monofluorometh	03 - 353.1; Sulfi sane}; VOA - \$	ides - 9030 260A (App	D3=Drum Selide DL=Drum Liquide T=Tiense Wis=Wips L=Liquid V=Vegetation
Relinquished By/Removed From	Dete/Time	Received By/Sta		ate/Time		Personno relinquis	h samp	vailable to hies from the 377	9 8 7				X=Cther
Relinquished By/Removed From	Date/Time	Received By/Sta	pred in D	Aste/Time		Ke1 #	U						
LABORATORY Received By SECTION	,			7	litle							Date/Time	
FINAL SAMPLE Disposal Me DISPOSITION	ethod					Disp	osed By					Date/Time	

Bechtel Ha	inford Inc.	CI	HAIN OF CUST	ODY/S	AMPL	E AN	IAL	YSIS	RE	QUEST			B02-050-01	Page 2	of 2		
Collector R. Fahlberg/R. Nielson			nny Contact ne Jacques	Telepho 372-9						Ject Coordin ENT, SJ	tor	Price Cod	8N	Data Tur	naround		
Project Designation 216-Z-11 Ditch Borehol	le Samples		ing Location West			SAF No. B02-050						Air Qua	lity 🗌	45]	Days ————		
Ice Chest No. ER	202008	Field I	ogbook No. 1517-		COA B20CW5	674C			F	thod of Shipe ederal Express	1						
Shipped To TMARECRA		Offsite	Offsite Property No. ADZOBS BIII of Ladi							of Lading/A	SEC OSPC						
POSSIB LE SAM PLE H	Tazards/remarks		,		1	Jos. 12			-1	-,		- }		-	}		
Radioactive Pote			Preservation	Cool 4C	Cool 4C	प्र		No	ne 	4.02							
Tie Special Handling an	TO BI 40L	+	Type of Container	s.G	₃G		_	PK	G .								
	001		No. of Container(s)	1	1	1_	<u> </u>		l 								
U.	501		Volume	250mL	120mL	•	domi.	1 -1-	mL			i			İ		
	SAMPLE ANAL	ysis	<u> </u>	See item (1) is Special 5 Instructions.		See it Sy Instr	m (2) in cond 6 octions.	See i co	n (2) in cial +	+ lo 02	-						
					Range - WIPH-G												
Sample No.	Matrix *	Sample Date	Sample Time														
B14DJ8	SOIL	4-23-0	2 1240	X	X		X_	<u> </u>									
				 		╁╴		 	-					_			
		<u> </u>				1											
CHAIN OF POSS		Sign/Prin Received By/fto		ste/Time		COC co									Matrix *		
Relinquished By/Removed Fr		STATE OF A			_ RIN	4-16-07	L				A CARL	ጉስ / ቤ ኃ ፈ ጥ።	methylbenzene, C	Sulchermone	S=Soli SB=Solicions		
Responshed By/Removed Fr		O REED WAYS	fed in PT W	gy/lipe	200 In	outyl pho	sphate}		de	imony-(15	-		•		SO=Solid Si=Sindge		
DOL 1A	3728 4.797	214.	<u> </u>	126		- Carreno opina -	-Spec(55: Nad	omplej Sam 94.	Padia.	<u>inn-134 Cesina</u> n. 226, Radium	<u>-137, C</u> c 228), I so	belt 60, Euroj Jopic Tharlon	dum-152, Buropa (Inodus-292),	Curbon 1	W=Water O=Oil		
Religion By Rambel F	PO C 4287	Roming Bysto	T-ED 2	ate Vine 4) (2)	isotopie	237 ₁ Mi Platoni	del 63; un; Ann	Chonic	m:: 89,99 - Tot .	1 Sr, Too	brotient-79,	mericina 241/C	pie Uzunya sium 24	A=Air DS=Drum Solids DL=Drum Liquids		
Religioushed By/Removed Fr	rom Date/Time	Received By/Sto	god In Di -30-	ate/Time		ld ass) (C	de aver-	r=13 }		_	<u>ب</u>		P	4.24.22	T=Times Wj=Wipe L=Liquid		
Relinquished By/Removed Fr		Received By/Sto		ate/Time			Perso	nnel ne	ot ava	ilable to	4				V=Vegetation X=Other		
Relinquished By/Removed Fr	rom Date/Time	Received By/Sto	red in D	ate/Time			Ref#	17	OU _	s from the 37	2						
LABORATORY Reco	cived By			1	îtle								,	Date/Time			
	posal Method	and the second s			<u></u>	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Disp	osed By	 :		-			Date/Time			

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD
Purchase Order/Project:

DATE: 4.30.0ン

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG #:

02046529

OTE:	ALL ENTRIES MARKED "NO" MUST BE I	EXPLAINED I	N THE COMM		4
1.	Custody seals on coolers or shipping container intact, signed and dated?	Ωνγes	□ No	□ N/A	☐ see Comment
2.	Outside of coolers or shipping containers are free from damage?	© Yes	□ No	□ N/A	see Comment
3.	Airbill # recorded?	Œ∕Yes	□ No	□ N/A	☐ see Comment
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as	D) Yes .	. 🖸 No	□ N/A	see Comment
	applicable)? (paperwork sealed in plastic bag and taped to inside lid)				
5.	Sample containers are intact?	El Yes	□ No	□ N/A	see Comment
6.	Custody seals on sample containers intact, signed and dated?	D, Yes	□ No	□ N/A	see Comment
7.	All samples on coc received?	DXes	□ No	□ N/A	see Comment
8.	All sample label information matches coc?	es .	□ No	II N/A	See Comment
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	D Yes	□ No	□ N/A	☐ see Comment a
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	TZ Yes	□ No	□ N/A	see Comment
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DMV	☐ see Comment (
12.	coc signed and dated?	,⊅ Yes	□ No	□ N/A	🗅 see Comment i
13.	coc faxed or emailed to client?	□ Yes	□ No	D N/A	see Comment
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	see Comment

Cooler # / temp and Comments:

208

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:

Vield Howing



Lionville Laboratory, Inc. PEST/PCB ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1760

DATE RECEIVED: 04/30/02

LVL LOT # :0204L529

CLIENT ID	LVL	#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
		<u></u>	******			***************************************	
B14DJ8	001		s	02LE0476	04/23/02	05/01/02	05/11/02
B14DJ8	001	MS	S	02LE0476	04/23/02	05/01/02	05/11/02
B14DJ8	001	MSD	S	02LE0476	04/23/02	05/01/02	05/11/02
LAB QC:							
							
PBLKNN	MB1		s	02LE0476	N/A	05/01/02	05/11/02
PBLKNN	MB1	BS	S	02LE0476	N/A	05/01/02	05/11/02

Agus frason



Analytical Report

W.O. #: 11343-606-001-9999-00

Date Received: 04-30-02

Client: TNU-HANFORD B02-050

LVL#: 0204L529

SDG/SAF #: H1760/B02-050

PESTICIDES

One (1) soil sample was collected on 04-23-02.

The sample and its associated QC samples were extracted on 05-01-02 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 05-11-02. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8081.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.
- 2. All required holding times for extraction and analysis have been met.
- 3. The sample and its associated QC samples received a sulfur cleanup.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. All surrogate recoveries were within acceptance criteria.
- 6. All blank spike recoveries were within acceptance criteria.
- All matrix spike recoveries were within acceptance criteria.
- All initial calibrations associated with this data set were within acceptance criteria.
- 9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria, with the exception of most target compounds analyzed on 05-11-02 at 20:17, 21:07 and 21:56 on the RTX-CLP2 column and with the exception of the target compound, Kepone analyzed on 05-11-02 at 21:56, on the RTX-35 column. The data reflected an increase in instrument response, so the ability to identify these compounds was not impaired. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
- 10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

lain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

pef\r:\group\data\pest\tnu hanford\04L-529.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

Lionville Laboratory S	ample Discrepancy Report (SDR) SDR #: 0264240
Initiator: bryce Soutaro	Batch: 07041529	Parameter: ccs >
Date: <u>5/21/02</u>	Samples:all	Matrix: So:\
Client: Thu	Method: sweencawwiclpi	Prep Batch: <u>०२८६०</u> ५७६
1. Reason for SDR		
a. COC Discrepancy Tech Profil	e Error Client Request Sar	
b. General Discrepancy	on Error Wrong Test Code Oth	lei
Missing Sample/Extract Co	ontainer Broken Wrong Sam	nple PulledLabel ID's Illegible
Hold Time Exceeded Ins	sufficient Sample Preservation of Amenable to Analysis	n Wrong Received Past Hold
Note*: Verified by [Log-In] or [Prep Group] (circ		
c. Problem (Include all relevant speci	ic results; attach data if necessary)	1
and a samples and	ac increased on conf. rolumn epone (increased on both adumns)	, OK on primary rotumn
ton all compounds except	epare Chichago Sa papa Rounnis.	· All Samples Clean.
2. Known or Probable Causes(s)		
1		
		•
3. Discussion and Proposed Action	Other Description: Navote	
Re-log Entire Batch		
Following Samples:		
Re-leach Re-extract	\wedge	
Re-digest Revise EDD		
Change Test Code to	_ \ /	
Place On/Take Off Hold (circle)		- 51/10
4. Project Manager Instructionssigns Concur with Proposed Action	ature/date:	- 6/2/102
☐/Disagree with Proposed Action; S ☐/Include in Case Narrative	ee Instruction	
Client Contacted:	•	
Date/Person	<u> </u>	
Cancel		•
5. Final Actionsignature/date:	Star Other Explana	ition:
Verified re-[log][leach][extract][dige Included in Case Narrative	st[[analysis] (circle)	
Hard Copy COC Revised		
Electronic COC Revised EDD Corrections Completed		
n	d, forward original to QA Specialist for o	distribution and filing.
Route Distribution of Completed SDR		n of <u>Completed</u> SDR
X Initiator X Lab General Manager;_M_T		: Beegle nic: Perrone
📈 🔀 Project Mgr: Stone/Johnson	/Haslett GC/LC	: Kiger
X Technical Mgr: Wesson/Dan X QA (file): Alberts	ileis MS: Ry Log-in:	/chlak/Layman Melnic
Data Management: Feldmar	n Admin:	Soos
Sample Prep: Beegle/Kiger	Otner:	



GLOSSARY OF PESTICIDE/PCB DATA

ITA QUALIFIERS

- Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 31.
- This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- nterserence.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- D1 = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF PESTICIDE/PCB DATA

- This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, Appendix IX List

RFW Batch Number: 0204L529 Client: TNUHANFORD B02-050 H1760 Work Order: 11343606001 Page: 1

	Cust ID:	B14DJ8	1	B14DJ8	:	B14DJ8	1	PBLKNN		PBLKNN BS		
Sample	RFW#:	001		001 MS	:	001 MSD)	02LE0476-M	B1	02LE0476-M	œ1	
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	D.F.:	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0	
	Units:	UG/K	G	UG/K	Œ	UG/K	G	UG/K	G	UG/K	G	
Surrogate:	Decachlorobiphenyl	115	*	115	*	120	*	110	*	110	ક	
	Tetrachloro-m-xylene	90	*	90	왐	95	ક	85	૪	85	૪	
=========	*======================================		=fl==	========	=fl==		=fl	=========	=fl	=========	=f1:	======fl
Alpha-BHC		1.7	U	1.7	U	1.7	Ū	1.7	U	1.7	U	
Beta-BHC		1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	
Delta-BHC		1.7	U	1.7	U	1.7	U	1.7	U	1.7	υ	
gamma-BHC (Lindane)	1.7	U	80	*	88	¥	1.7	U	64	ક	
Heptachlor_		1.7	U	84	*	90	*	1.7	U	82	*	
Aldrin		1.7	U	84	*	88	ક	1.7	U	80	ક	
Heptachlor	epoxide	1.7	U	1.7	U	1.7	U	1.7	U	1.7	Ü	
Endosulfan	I	1.7	Ū	1.7	U	1.7	U	1.7	U	1.7	U	
			U	92	*	98	ક	3.3	U	89	ક	
4,4'-DDE		3.3	Ü	3.3	U	3.3	Ū	3.3	U	3.3	U	
Endrin		3.3	U	105	왐	112	¥	3.3	U	99	*	
Endosulfan :	II	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	
4,4'-DDD		3.3	U	3.3	Ū	3.3	U	3.3	U	3.3	U	
Endosulfan	sulfate	3.3	U	3.3	U	3.3	U	3.3	U	3.3	Ü	
		3.3	U	73	ક	81	ક્ર	3.3	U	51	왐	
Methoxychlo:	r	17	U	17	U	17	Ū	17	U	17	U	
Endrin alde	hyde	3.3	U	3.3	U	3.3	Ü	3.3	U	3.3	U	
Kepone		17	U	17	U	17	U	17	U	17	Ū	
alpha-Chlor	dane	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	
gamma-Chlor	dane	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	
		170	U	170	U	170	U	170	U	170	U	
Isodrin		3.3	U	3.3	Ū	3.3	Ū	3.3	Ū	3.3	U	

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

glorifieda

Report Date: 05/21/02 14:09

	Onville Laboratory Use Only Custody Transfer Record/Lab Work Request Page of Control of																							
Lionville Labor	atory L	Ise Only	ustoc	dy Trar	nsfe	er l	Rec	ord/l	_ab '	Wo	rk	Re	qu	es	t Pa	age_	<u>(</u> ,	<u>; </u>	-		3	k,	·1	1
02046	50	9	FIE	LD PERSON	INEL:	COM	PLETE	ONLYS	HADED	ARE	AS B	•	T	=	F	G	Н		~	T		(ONMITE)	NIORAJO.	HE JAC
TNU- HA	n/F	2P >	B02-09	<u> </u>			Refrige	rator #		7	5	5	5	5	5	5	5		5	5	5	5		
Est. Final Pro				<u> </u>					Liquid															
Project #). Samp	(343-601	- 001-	9999-00)		#/Туре	Container	Solid	IAG	146	146	116	jAG-	1AG	IAG	IHG		1AG	1PC	IAC	IAG-	7	
Project Conta							Volume)	Liquid					45.3		145	7.0		}				4	
		Project Manage		05,			 - <u>-</u>	<u> </u>	Solid	d50	250	250	250	120	757	Jac	250		120	<u> </u>	250	190	・ こ し	
0c 5/0	<u> </u>	Del 5TU	TAT	30 Y	<u>447</u>		Preserv	/atives	<u> </u>		ORG	ANIC		2	<u>૧૮છ</u> ા	1 Uer	INC	ORG	ORV	70	Tal D	ne.	4	
Date Rec'd	4-3	10-02	Date Due	5-30-0	<u> </u>		ANALY REQUE		-	δ V	BNA	PCB B	Herb	eg	GUIC KET	Hen	Neta E	8	OKO	ANI	MI	27.2	2	
MATRIX					Ma	ıtrix	<u> </u>						Ų	_	Llony	ille La	borat		se Onl	y	1			
CODES: S - Soil SE - Sediment	Lab ID	, CIH	ent ID/Descript	tion	Che	OC Osen ⊮)	Matrix	Date Collected	Time Collected	水100	0625×	87 JO	OHBG	19000	06.050	TCRE	MET®		05.20	ZWORED	TTCLP	e HYEN	RCRATCW	
SO - Solid SL - Sludge					MS	MSD		435.3		_	0	0	Ö	0	Ō	Н	3		00	H	H	14	इ	
W - Water O - Oil	001	B14D			1	1	5	4-23-02	1240	1	1_	1	/_	1	1	1	1	1.	11	1		 		
A - Air DS - Drum Solids	- Air Drum 002 BI4DIB telp of ool							 *		ļ	ļ			} -	<u> </u>		ļ	_	-	ļ	-			
DL - Drum Liquids		<u> </u>		<u> </u>	-	-						-					-	 	 		-	┼		
L - EP/TCLP Leachate				<u> </u>		-					 		<u> </u>							-		-		
WI - Wipe X - Other				<u> </u>		├		 		\vdash							-		+	-	-	+		-
F - Fish	 -					┼─		 	<u> </u>	 			-		 		-		+	-	-	┼		
ļ	 -			-	+	\vdash	 -						-		 	-	_		+-		1.	+		-
				· · ·							-											+		
-	}				1		-	*	Su	La	ch	on	-						-			1	-	
Special Instruct	ions:		7				REVISIO	NS:					M		. 41.	1/3		!	Lionv	lle Lab	orator	y Use O	nly	<u></u>
	SAF # BOZ-050 METC) 1 KCKH + Be, B, Cu, Mg, Mn, Mo, N, V, En Samples were: Tamper Resistant Seal was: 1) Shipped or 1) Present on Outer Package (Y) or N																							
	OGCSC 3. Alcohols, Gly cals + Katones Airoill # 2) Unbroken on Outer Package Y or N																							
						5.1-	OL	4. Cono	1 062	4 X	A	6	062	+ N			_ 2	-) Ambie	Package V or I			rubje M		
					•	5.7.	٥2	5. <u>Canc</u>	LOHI	3 <u>6 N</u>	A	11_	0 <i>HB</i>	6X			_ 3 _ c) Recei conditio	ved in C	Good or N	2 y or N 4) Unbroken on			r N
			•					6									_ 4) Samp	iles			ample C		N
Relinquished		Received	Date	Time	lelinqui by			Received by		Date	Tir	ne	Sam	ples L	ies Bet abels a	nd _	5		_	or N		OC Recipon Sar		ec't
ONIGINAL COS Become V 40											Holding Times Cooler (Ÿ) or N Temp. 1.5													

UXUYL DAY

Bechtel Hanfor	d Inc.	CI	HAIN OF CUST	TOD 1/5AMI LE ANALISIS REQUEST									of 2
Collector R. Fahlberg/R. Nielson		Compo	my Contact ne Jacques	Telephor 372-96	e No.			Project Coordi TRENT, SJ		Price Code	8N	Data Tui	naround
Project Designation 216-Z-11 Ditch Borehole Sam	ples	Sample	ing Location West		*		·	SAF No. B02-050		Air Quality		45]	Days
Ice Chest No. ERA -	800-50	Field I	.ogbook No. 1517-		COA B20CW5	674C		Method of Ship Federal Expre					
Shipped TO TMA/RECRA			Property No.	DZÓ	48	8		Bill of Lading	Air Bill N	8 05	20		
POSSIBLE SAMPLE HAZAI Radioactive Potent	ral	_	Preservation	Coal 4C	Cool 4C	Coal 4C	Cool	4C Cool 4C	Cool 40	C Cool 4C	Cool 4C	Cool 4C	Cool 4C
I .	OB14DL	7	Type of Container	aG	aG	aG .	P	aG	aG	aG	aG	e.G	aG
Special Handling and/or	· ·		No. of Container(s)	1	1	1	1	1	î	i	1	1	1
Cod	oL		Volume	120mL	250mL	120mL	1000a	nL 120mL	250mI	120mL	250mL	250mL	250mL
	SAMPLE ANALYS	SIS		See item (1) in Special Instructions.	See item (2) in Special Instructions	Hex - 7196	See item Speci Instruct	ni D1385	PCBs - 80	Pesticides - 8081	Herbicides - 8150A	See item (4) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015 (Methanol)
Sample No.	Matrix *	Sample Date	Sample Time										
B14DJ8	SOIL	4-23-0	23-02 1240		X	X	X	' X	X	X	χ	Х	X
		-			 	 		·					
						-		- 		- 			
					<u> </u>							 	
CHAIN OF POSSESSIC Relinquished By/Removed From	Date/Time /615	Sign/Prin Received By/Flor		tc/Time		CIAL INSTR)NS					Matrix *
Relinquished By/Removed From Relinquished By/Removed From Relinquished By/Removed From Relinquished By/Removed From	ed in Di	ste/Time	(1) Mer (2) ICP Mol (3) (4) DX A	Metals by ICP (T cury (TCLP) - 1: ICP Metals - 601 Metals - 6010A Metals - 6010A Metals - 6010A Metals - 300. VOA - 8260A (I Add-On) (Tetrals	ICLP) - 1 311/7470 10A (Supertra l, Vanadii O (Fluori ICL); VO ydrofuran	ertrace) (Arsenic, Ba ce Add-On) (Berylli um, Zinc); Mercury ide, Nitrate, Sulfate) DA - 8260A (Add-On	rium, Cadr um, Boron - 7470 - (C ; Ammonia) (Trichlor	mium, Chromium, , Copper, Magnesi (V) 1 - 350.3: NO2/NO	Lead, Selenium um, Manganes 3 - 353.1: Sulfi	n, Silver}; e,	S=Soil SE=Schimest SO=Soild SH-Shidge W = Water O=Oil A=Air DS=Drum Soilds DL=Drum Liquids T=Tissue W2=Wipe L=Liquid V=Vegetation X=Other		
LABORATORY Received By SECTION				Ti	tie						1	Date/Time	
FINAL SAMPLE Disposal M DISPOSITION	FINAL SAMPLE Disposal Method					Dispo	sed By					Date/Time	

	Hanford	Inc.	C	HAII	N OF CUST	ODY/S	AMPL	Æ A	NAL	YSIS	RE	EQUEST	'	В	2-050-01	Page 2	of <u>2</u>
Collector R. Fahlberg/R. Niel	son		Comp	any Co ane Jacq	ntact	Telephoi 372-90	ne No.				Pro	ject Coordin ENT, SJ	ofor	Price Code	8N	Data Tu	naround
Project Designation 216-Z-11 Ditch Bo	rehole Samples	1		ling Lo	cation							F No. 1-050	,	Air Qualit	y 🗆	45	Days
Ice Chest No.	2 C O	2-008	Field EL	Logboo -1517-	k No.		COA B20CW	5674C			F	thod of Ships ederal Expres	5				
Shipped To TMA RECRA			Offsit	е Ргоре	erty No. A	りてら	08	8		_	Bijj	i of Lading/A	ir Bill No	se o	SPC		_
POSSIBLE SAMPI	E HAZARD	S/REMARKS			7				d in	l l		, ,				1	
Radioactive Pb	tentia	1		,	Preservation	Cool 4C	Cool 4C	Z	**	Non	4	4.02					<u> </u>
Radioactive P6 T1 Special Handling	e TO (B14DL rage	7	Ту	e of Container	aG	aG			a-G							
	_	-		No.	of Container(s)	1	1		ł	1							
(اهمر				Volume	250mL	120mL	1) OmL	1200				 		 	<u> </u>
						See Hern (1) in			10 (8) in			4/L/02				 	
	SAMBY PANAT VSIS					Special 5	Range -	l s	pecial 6 buctions.	Speci	4	1					
	SAMPLE ANALYSIS					Instructions.	WTPH-D		alicacine.	Instruct	jons.						
							Range - WIPH-C	,	1								
:								1	1	1 1							ļ
Sample No).	Matrix *	Sample Date		Sample Time												
B14DJ8		SOIL	4-23-0	ム	1240	X	X		Δł.	X							
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			-			 -	 							<u>. </u>		-	
						1	1	+		<u> </u>					 		<u></u>
			<u> </u>			<u> </u>	<u> </u>			<u>i</u>		<u> </u>			<u> </u>		
CHAIN OF PO		Data/Finns &#	Sign/Pring Received By/(to			ate/Time			INSTE	CTIC	NS						Matrix *
Relinquished By/Remov	Prom	Date/Time (G.			4. 23.0		- RIN	V4-16-0	2_								S=Soil SB=Sediment
Re Inquished By/Remove	ed From	Date/Time	Drocen di syste	ted in	77-7-7	<u>ک ا </u>	77 X (7)	ibutvi ob	osphate}		- A.L	immu -125		n) {1,2,4-Trime			SO=Solid Si=Sludge
ROP IA	- 3 <i>+</i>	8 U.797	7/12/7	لر ا	KINOJ		Lea	<u> ننک</u>	ا محک	Complete	Cesi	nm-144 Cerine	n_137_Cob	olt 60, Seropius Pic Thurium (I	n-152, Buropium	AC1-0	W = Water O=Qil
Relinquished By/Removi	Trove Ce	Date/Time Do	Reperved By/Sto	redilar		ate/Jime 4	2901 M	Mobilian.	199, 14100 237; Nic	sura 114, 1 deal 63, 8	e cardin	n 226, Nodeum um 89,90 – Tot	220 J. ISOU 4 Dr. Took	spie Thorium (1 notium-99; Trici	norum 232); 6 un - 113, isotop	ie Uranium	A=Air
KICT	Z	2(1, 4-28)	AZIV_W.U~	<u> </u>	として	ate/Time	D(2)) Isotopi		un, And					ricium 241/Our	14 24 A	DS=Drum Solids DU=Drum Liquid
The state of the s	Reliantished By/Removed From Date/Time Received By/Stored In						`	(Car Only (contratt-1	457			_		β.	1.24.02	T=Tissue WI=Wips
Feel 50 4.30-02 1005 /- News						ate/Time	<u>^</u>		Dones			}	ノナ		_	1,2,50	V≕Vegetation
Relinquished By/Removed From Date/Time Received By/					ں رے	ercy f mills			relina	unei do Vish.se	r avai mple:	ilable to	770				X=Other
Retinquished By/Removed From Date/Time Received B				red In	D	ate/Time			Ref#	14	on_	s.from the 37	2				
LABORATORY Received By SECTION						T	itle									Date/Time	<u> </u>
FINAL SAMPLE Disposal Method					-				Disp	osed By						Date/Time	
DISPOSITION																	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD
Purchase Order/Project:

DATE: 4.30.02

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG #: 02041529

OTE:	ALL ENTRIES MARKED "NO" MUST BE	EXPLAINED I	N THE COMM	MENT SECTION	N
1.	Custody seals on coolers or shipping container intact, signed and dated?	□\??es	□ No	□ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	□ Y es	□N ₀	□ N/A	See Comment #
3.	Airbill # recorded?	DYes	□ No	□ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as	D Xes	. □ No	□ N/A	see Comment #
	applicable)? (paperwork sealed in plastic bag and taped to inside lid)	/			
5.	Sample containers are intact?	□ Yes/	□ N ₀	□ N/A	See Comment #
6.	Custody seals on sample containers intact, signed and dated?	□,y es	□ No	□ N/A	☐ see Comment #
7.	All samples on coc received?	D) es	□ No	□ N/A	see Comment #
8.	All sample label information matches coc?	□, YEs	□ No	□ N/A	See Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	D Yes	□ No	□ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	To Yes	□ N ₀	O N/A	See Comment #
11.	Where applicable, bar code labels are affixed to coc?	D Yes	□ No .	Aאלם	see Comment #
12.	coc signed and dated?	√ Yes	□ No	□ N/A	☐ see Comment #
13.	coc faxed or emailed to client?	□ Yes	□ No	□ N/A	see Comment #
	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	D N/A	☐ see Comment #

Cooler # / temp and Comments:

2008

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:

Viet Newody



Lionville Laboratory, Inc. PCB ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1760

DATE RECEIVED: 04/30/02

LVL LOT # :0204L529

CLIENT ID	LVL #	мтх	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14DJ8	001	s	02LE0476	04/23/02	05/01/02	05/12/02
		_				05/12/02
B14DJ8	001 MS	S	02LE0476	04/23/02	05/01/02	05/12/02
B14DJ8	001 MSD	S	02LE0476	04/23/02	05/01/02	05/12/02
LAB QC:						
PBLKNN	MB1	s	02LE0476	N/A	05/01/02	05/12/02
PBLKNN	MB1 BS	S	02LE0476	N/A	05/01/02	05/12/02
						4 . 1 1

Algustaston



Analytical Report

W.O. #: 11343-606-001-9999-00

Date Received: 04-30-02

Client: TNU-HANFORD B02-050

LVL#: 0204L529

SDG/SAF #: H1760/B02-050

PCB

One (1) soil sample was collected on 04-23-02.

The sample and its associated QC samples were extracted on 05-01-02 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 05-12-02. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.
- 2. All required holding times for extraction and analysis have been met.
- 3. The sample and its associated QC samples received a sulfuric acid and a sulfur cleanup.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. One (1) of five (5) surrogate recoveries was outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
- 6. All blank spike recoveries were within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- All initial calibrations associated with this data set were within acceptance criteria.
- All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 10. Confirmation was not required because target compounds were not detected in any of the samples.
- 11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

lain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

pef\r:\group\data\pest\tnu hanford\04L-529.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of

the analytical data. Therefore, this report should only be reproduced in its entirety of



GLOSSARY OF PESTICIDE/PCB DATA

ATA QUALIFIERS

- Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- nterference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.



GLOSSARY OF PESTICIDE/PCB DATA

- This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 05/16/02 10:48 RFW Batch Number: 0204L529 Client: TNUHANFORD B02-050 H1760 Work Order: 11343606001 Page: 1

	Cust ID:	B14DJ8	3	B14DJ8	3	B14DJ8	3	PBLKNN		PBLKNN BS		
Sample	RFW#:	001	L	001 MS	3	001 MSE)	02LE0476-M	в1	02LE0476-MB	1	
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	D.F.:	1.0	0	1.0	0	1.0	0	1.0	0	1.00		
	Units:	UG/I	(G	UG/P	CG	UG/K	Œ	UG/K	G	UG/KG		
Surrogate:	Tetrachloro-m-xylene	110	*	110	*	105	*	110	*	110	%	
	Decachlorobiphenyl	120	*	120	*	120	ŧ	120	*	125 *	*	
			=fl==		=fl==	.=======	=f1	========	= f l	===========	fl=====:	=====f
Aroclor-1016		36	U	102	ŧ	103	¥	33	U		ŧ	
Aroclor-1221		72	บ	72	U	72	U	67	U	67	ប	
Aroclor-1232		36	U	36	U	36	U	33	U	33	U	
Aroclor-1242		36	U	36	U	36	U	33	U	33	ប	
Aroclor-1248		36	U	36	υ	36	U	33	U	33	U	
Aroclor-1254		36	ប	36	ប	36	U	33	υ	33	บ	
Aroclor-1260		36	ט	108	¥	109	¥	33	U		¥	

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

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Lionville	Laboratory	Use	Only

Custody Transfer Record/Lab Work Request Page of

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

													ν_{-}	<u>Ľ</u>	<u> </u>	G				<u> </u>				
TNU - HA	NFO	ORP	B02-0	50		Refrige	rator#		1	5	5	ک	М	ς	5	5		ک	5	5	5			
Fet Final Pro	Semr	ding Date	~				#/Type	Container	Liquid	1.46					4.6		.///		0.0	. ()				
Project #		1343-60	06-001	-9999-	00				Solid	1AG	100	146-	116	jAC	1AG	IAG	[/16-	1 1 1 N	IHG	INC	/AC-	1A6-	7	
Project Conta	ct/Phor	10 #			:		Volume	•	Liquid	S1	1 () () ()	2	J(~*)	/24	7570	120	251			7	7.5	45-	4	
Lionville Labo				05	,		<u> </u>		Solid	050	250	250	dyu	/dQ	250	100			<u> 20</u>		250	/20	J	*
oc 3/6		Del	TAT	30	your		Presen	Atives		-	ORG	ANIC		 0	ACO I	Hey	, INO	RG	ORD	IC	TAL D	Æ	Ą	
	., ,			•			ANALY		-	δÓ	BNA	Perst PCB	Herb	En	ALCOI GLIC	46	Z-igi				MeT	3	ب	
Date Rec'd	4 - 3	0-02	Date Due _	5-30	1-05		NEGOL	.3120		<u>×</u>	ξ.	4 9	Ĭ		her	18/	4 ₹		-/40	-74	, ,	5.4	اد	
MATRIX	!					latrix QC							<u> </u>		Lionvi	lie La		ory Us	e Only		+		5	
CODES: S - Soil	Lab ID	(Client ID/Descri	ption	C	hosen	Matrix	Date Collected	Time Collected	*190	0625×	8	OHBG	19090	OGCSC	و	9	•	83	IND RED	LTCLP	HYEN	RCRATCH	
SE - Sediment SO - Solid	10	,				(v)		Conscies	V 01100100	و ا	29(0P CB	#B	90	၂ မွ	ECR 6	MET		02/30	3	1 7 .	Ŧ	C.C.	
SL - Sludge	001	221117	<u> </u>		MS	MSD	5	4-23-02	1240	_	٧	1	7	7	 		 -		7	1	7		8	-
O - Oil A - Air	001	B142			_		 	+	1240	-/-		<u> </u>	 '	1	1		 		-		-	-		
DS - Drum Solids	200	RIGIDA	B tel	of oo	\ 	+	<u> </u>	 			-				-							\vdash		
DL - Drum Liquids					_		<u> </u>		-				-				, .							
L - EP/TCLP Leachate			·	}				<u></u>				-		 								-7		
WI - Wipe X - Other						<u> </u>				-		-												
F - Fish						+	1 1						 		-			12 1	 		_			
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				<u> </u>		-		*	SZ	1/-1	66	_	-		1 2 7						-			├─
Canalal Instruct	<u> </u>	<u>1</u>				DATE	/REVISIO	NS:					<u> </u>	L	<u> </u>	<u></u>			Llanul				-	<u> </u>
Special Instruct	ions:	SAF #	B05-0	250		Μę	<u>~()</u>	1. RC	<u>ea +</u>	Be,	<u> 3. C</u>	Mg	<u>, M</u> ,	<u>. M</u>	<u>o, Ni.</u>	V.Z	<u>n .</u>	amples		/ Lab	-	Use O	- <u>-</u>	
						TNO	26K()_	2. ICFL	ICNO:	IC:	0 Ψ.	INH	3N :	LN3N	2. IS	FD	1)	Shippe	id <u> </u>		1)	Present	CON OL	uter
						06	esc.	a Alcol	uols. G	ار ده	ls.+/	Leton	N		•		Aé	and De	\mathcal{A}	1	_	ickage (Unbrok	_	
OGCSC 3. Alcohols, Glycols + Ketoner 5-1-02 4. Conal Obzxx Add ObzxN												re			Pa	ckage	∜∕or	N						
																Ambie Receiv	•		3)	Present	Yon Sa	ımple r N		
						5-7	5-7-02 5. Concl OHBGN Add DHBGX						Condition or N 4) Unbroken on											
	Palingulahad Bacaiyad Relinguisha											$\overline{}$						Sampl roperty		ved		ample (
Relinquished	Relinquished Received Date Time Relinquish by by							Received by		ate	Tin	ne			ies Bet abels ar		en V or N Upon Sample, Rec't					ec't		
F. 7 50	V-	Non &	4-3002	1005	C	OMP	OSITE		ORIG]		coc	Reco	rd? Y		S) Necessed vylidiki Control							
		(end	STE		REWF	WRITTEN POTES:				7//	Y or N Temp. 1.5 °C													

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Bechtel Hanfor	HAIN OF CUST	DE OD ITOMINI DE INTERES DES REQUEST							Page 1	of 2			
Collector R. Fahlberg/R. Nielson			any Contact ane Jacques	Telepho 372-9		, , ,		Project Coord TRENT, SJ	inator I	rice Code	8N	Data Tui	naround
Project Designation 216-Z-11 Ditch Borehole Samp	oles		iing Location West					SAF No. B02-050	A	ir Quality	45]	Days	
Ice Chest No.	800-50	Field EL	Logbook No. 1517-	COA Method B20CW5674C Fede								· · · ·	
Shipped TO TMARECRA		Offsit	e Property No. A	カァド	HR	8		Bill of Lading	Air Bill No.	05			
POSSIBLE SAMPLE HAZAR Radioactive Potent	ral		Preservation	Cool 4C	Cool 40	ool 4C Cool 4C C		4C Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
TIE 7 Special Handling and/or S	O BI4D	G7	Type of Container	aG	aG	aG	P	aG	вG	aG	aG	aG	вG
Coc	-		No. of Container(s)	120-1	1	1	1		1	1	1	1	1
	Volume	120mL	250mL		1000		250mL	120mL	250mL	250mL	250mL		
	See item (1) in Special Instructions.	See item (2 Special Instruction	Hex - 7196	See item Speci Instruct	al D1385	PCBs - 8082	Pesticides - 8081	Hesticides - 8150A	See item (4) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015 (Methanol)			
Sample No.	Matrix *	Sample Date	Sample Time										
B14DJ8	SOIL	4-23-0	2 1240	X	X	X	Χ	′ X	Х	X	Χ	Х	Χ
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													·
CHAIN OF POSSESSION		Sign/Prin	t Names	<u>. </u>	SP	PECIAL INSTR	LUCTIO	NS	<u> </u>		<u> </u>		Matrix *
Relinquished By/Removed From R. F. Lelo J. P. C. Lel Rejinquished By/Removed From O. L. I.A. 3.7.2	Date/Time 615	Rost I	A 4.2302	Me/Time	(I) M (XCS)	(ercury (TCLP) - 1	TCLP) - 1 311/7470	311/6010 {Arsenic, ertrace) {Arsenic, B				•-	3=8ail \$6=3ediment \$0=\$olid \$1=8ludge
Robinstated By Rempara Plan	Date/Time	Received By/Sto	Tip "	ate/Time	(4)	CP Metals - 6010A folybdenum, Nicke i) IC Anions - 300 i) VOA - 8260A ((Supertra i), Vanadi :0 (Fluori ICL); VC	ce Add-On) {Beryll am, Zinc}; Mercury de, Nitrate, Sulfate} A - 8260A (Add-Or	ium, Boron, C - 7470 - (CV : Ammonia -	opper, Magnesi) 350.3: NO2/NO	um, Manganese 3 - 353 1: Sulfi	der - 9030	W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue
Relinquished By/Removed From Relinquished By/Removed From	wed 450	ا لدل ste/Time	1 IX	K Add-On) (Tetrah Personne	ydrofaran !l not av	ailable to	}				WI=Wipe L=Liquid V=Vegetation X=Other		
Relinquished By/Removed From	red In De	ste/Time		Ref#	A on	es from the 372 4 2910	Z						
LABORATORY Received By SECTION					itle			<u> </u>			I	Date/Time	
FINAL SAMPLE Disposal Method DISPOSITION						Dispo	osed By					Date/Time	

Bechtel	Hanford Inc.	HAIN OF CUST	CUSTODY/SAMPLE ANALYSIS REQUEST B02-050-01 Page						Page 2	of <u>2</u>				
Collector R. Fahlberg/R. Niels	son	Comp	any Contact ine Jacques	Telepho 372-9	ne No.				Project Coordi TRENT, SJ		Price Code 8N Data Tu			naround
Project Designation 216-Z-11 Ditch Bor	ehole Samples	Samp	ling Location						SAF No. B02-050		Air Quality [45]			Days
Ice Chest No.	2002-008	Field EL	Logbook No. 1517-		COA B20CW5	674C			Method of Ship Federal Expr	283				
Shipped To TMA RECRA		Offsit	e Property No. A	<i>ØZO</i>	888	3			Bill of Lading	Air Bill I	ee c	SPC	-	_
POSSIBLE SAMPL	E HAZARDS/REMARKS	7			1	, G	. 1							
Radioactive Pb	tential		Preservation	Cool 4C	Cool 4C	Ž,	Z.4.	Non	12 4.0Z		_			
Special Handling	tential LTO BI4DL and/or Storage	+	Type of Container	aG	aG			aG						
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	250mL むい 4-16	120mL	1 1	0mL 14-46-	110m	L Lai + 16/02								
· · · · · · · · · · · · · · · · · · ·				See item (1) i	n TPH-Diesel	See it	n (T) in	See i em	(2)(in	 		1	 	
:	CAMBI PANA	vete		Special 5 Instructions	. WTPH-D;	Insta	cial 6 ctions.	Instruct	ult ions.					[
	SAMPLE ANA	F1.212			TPH-Gasolin Range -	•		1 1	:		Ì			
				1	WTPH-G	} '		\		1			1	<u> </u>
	3 destrict	CI- D-4-	Comple Time		80 200 200 200		1							
Sample No		Sample Date			<u> </u>									
B14DJ8	SOIL	4-23-0	2 1240	1 X	$+$ \times		1	_₹		 			 	
								<u> </u>					<u> </u>	
			. [
CHAIN OF PO		Sign/Pri				CIAL I			NS SA					Matrix *
Relinquished By/Remov		7 Received By/(to		Oate/Time	RIN	COC 000 4-16-02		on SAF						S-doil
17 felle	Kofahlber 4.23.	05 15 L 1	-A 4.23.	32 19	12 (4)	Semi-VC)A - 827		.); Semi-VOA 82		Cn) {1,2,4-Trime	thylbenzene, Cy	clohexanone,	SG=Sediment SG=Solid
Re. Inquished By/Ramove	nd Prom Bete/Time (D)	3 man di Walio	ed in 17 Nov	252		outyl phos	mec_£	omplete!	Autimony - 12 (Cesium-134 Cesi	1111.C	obalt 60, Europitz	n-152, Buropiun	FISA	SI-Sludge W = Water
Religional By Renova	The Conductions Of	Reserved By/Sto	roditor of a	Saic Vine 4	740	epium 15	5, Niob		ladium 216, Radiu romina, 89,00 - T	n 220), 15	oopic Thurium ()	Rothur 292), C	erban 1	O=OH A=Air
RYCE	1 P C 428	227.00.0	1-EN 6	K ji	ັ b eri	Lotopie	Pharmit	an, Fuic	kilum-241/Carlum			ricium 241/Ouri		DS=Drun Solida DL=Drum Liquida
Religioshed By/Remove	nod in I	Date/Time		ld en) (C	TIMIT-Z	43)	,	<u>-</u>		ΙΖ.	1.24.02	TwTissue WI=Wips L=Liquid		
Relinquished By/Remove	Date/Time			Persoi relina	nnei no: uish.sa:	available to	<u>K</u>				V=Vegetation X=Other			
Relinquished By/Removed From Date/Time Received By/Stored In							Ref#	19	nples from the on 4/29 k	22				
LABORATORY Received By					Title								Date/Time	
SECTION FINAL SAMPLE Disposal Method							Dispo	sed By					Date/Time	<u> </u>
DISLOSTITON	DISPOSITION													

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD Purchase Order/Project:

DATE: 4.30.02

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG #:

02046529

TE:	ALL ENTRIES MARKED "NO" MUST BE	EXPLAINED I	N THE COMM	ENT SECTION	٧
1.	Custody seals on coolers or shipping container intact, signed and dated?	□ZYes	□ No	□ N/A	see Comment #
2.	Outside of coolers or shipping containers are free from damage?	€ es	□ No	□ N/A	see Comment #
3.	Airbill # recorded?	⊞∕Yes	□ No	□ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	D.Xes	. 🗆 No	D N/A	see Comment #
5.	Sample containers are intact?	□ Yes/	□ No	□ N/A	□ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	□, y es	□ No	□ N/A	□ see Comment #
7.	All samples on coc received?	DX es	□ No	□ N/A	☐ see Comment #
8.	All sample label information matches coc?	ه) الم	□ No	□ N/A	See Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	Ð yes	□ No	□ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	Yes	□ No	□ N/A	See Comment #
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DWA	see Comment #
12.	coc signed and dated?	√Z Yes	□ No	□ N/A	see Comment #
13.	coc faxed or emailed to client?	□ Yes	□ No	DNA	see Comment #
	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	☐ see Comment #

Cooler # / temp and Comments:

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:



Lionville Laboratory, Inc. GRO ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1760

DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14DJ8	001	s	02LVJ504	04/23/02	N/A	05/04/02
B14DJ8	001 MS	S	02LVJ504	04/23/02	N/A	05/04/02
B14DJ8	001 MSD	S	02LVJ504	04/23/02	A/N	05/04/02
LAB QC:						
TBLKED	MB1	S	02LVJ504	N/A	N/A	05/04/02
TBLKED	MB1 BS	S	02LVJ504	N/A	N/A	05/04/02
						,

100-102/02 100-105/cm



Analytical Report

Client: TNU HANFORD B02-050

LVL #: 0204L529

SDG/SAF#: H01760/B02-050

W.O. #: 11343-606-001-9999-00

Date Received: 04-30-02

GRO

One (1) soil sample was collected on 04-23-02.

The sample and its associated QC samples were analyzed according to Lionville Laboratory OPs based on SW-846 methods for Gasoline range organics (GRO) on 05-04-02. The analysis met the intent of method WTPH-G.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.
- 2. All required holding times for extraction and analysis have been met.
- 3. The method blank was below the reporting limits for all target compounds.
- 4. All surrogate recoveries were within acceptance criteria.
- 5. The blank spike recovery was within acceptance criteria.
- 6. All matrix spike recoveries were within acceptance criteria.
- 7. All initial calibrations associated with this data set were within acceptance criteria.
- 8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

pef\r\group\data\gro\04-529.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

Date 5/24/02



GLOSSARY OF GASOLINE RANGE ORGANICS DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- **BSD** = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF GASOLINE RANGE ORGANICS DATA

- **D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.

R:/SHARE/GCVOLATILE/GCVOLATILEGLOS.DOC

Lionville Laboratory, Inc.

GAS RANGE ORGANICS

Client: TNUHANFORD B02-050 H1760 Work Order: 11343606001 Page: 1 RFW Batch Number: 0204L529 Cust ID: B14DJ8 B14DJ8 B14DJ8 TBLKED TBLKED BS 001 MS 001 MSD 02LVJ504-MB1 02LVJ504-MB1 Sample RFW#: 001 SOIL SOIL Information SOIL SOIL SOIL Matrix: D.F.: 1.00 1.00 1.00 1.00 1.00 UG/KG UG/KG UG/KG Units: UG/KG UG/KG 82 % 72 * 93 % 95 Fluorobenzene 82 Ł Gasoline Range Organics (GRO) 36 U 89 % 84 % 30 U 95 %

Bustisla

Report Date: 05/23/02 09:26

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

W VUII

Lionville Labor	atory U	lse Only	C	Custody Transfer Record/Lab Work Request Page											age_	<u></u> of			Ť	3	1	, I	1			
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0007												<u>A</u> _	` <u>`</u> 3	<u>C</u>				G	H		<u>I</u>	<u> </u>	K			
Client #/	NFO	ORD	ľ	302-0	250	•			Refrige	rator #	·	1	5	5	کا	5	5	5	5		5	5	5	5		
Est. Final Pro	j. Samp	iling Date							#/Type	Container	Liquid	140	10/		·L	4/	.11	147	ıA/		1 1 1 1	13)	100	IAG-	J	
Project #	1	1343-	-60b	- 001	- 999	19-00					1	146	(Ho-	/AG-	176	1#0	iAG	(HC	יטוון		(Av	<i>10</i>	1/1/	IAG	4	
Project Conta	ct/Phor	ne #							Volume	1	Liquid	- 		200	120	250	120	251		/ao	1	250	/20			
Lionville Labo	oratory					05			Preservatives				-	_							-			-	ن	
ac 5/6	<u> </u>	Del 5	10	TAT		30 40	<u>4)</u>	_					ORGANIC			e	ALCOT GUYC	Hey	INC	RG	ORU	IC	TOLP	1/2	CA	<u> </u>
Date Rec'd	4 -3	0-02	_ (Date Due		5-30-0	اك		REQUE		—	δ V	BNA	100	Herb	Est	Ket	4/2,	2007 Metal	2	VX0	AN;	MI	Manari is	رد	
MATRIX	Ī						M	atrix					· · · · · · · · · · · · · · · · · · ·		Ų		Lionv	ille La	borate			y	<u>†</u>			
CODES: S - Soil SE - Sediment	Lab iD		Clie	nt ID/Desc	ription		Ch (2C osen ⊬)	Matrix	Date Collected	Time Collected	水100	0625×	0603	OHBGX	18000	06650	rce6	MET (02/00	ZWORLD	TTCLP	HYEN	RCRATTCIN	
SO - Solid SL - Sludge	 	32 4	/ 				MS	MSD		1/22 2 2	1344		10		10	1	10	<u> </u>	-		7	m	-	-	\$	-
W - Water O - Oil		B/4					V	1	<u>></u>	4-23-02	1240		#		-	1	1-	1	1		1		'	 / _ 	-	
A - Air DS - Drum Solids	005	B141	9 <u>2 6</u>	te	ب ما	100	✓	-	<u> </u>	 *	1 a	<u> </u>	\vdash	-		-		<u> </u>			 			_	/	
DL - Drum Liquids	ļ						 	ļ	<u> </u>		<u> </u>	ļ			-	<u> </u>						-		-		-
L - EP/TCLP Leachate	-					 -	 	 	<u> </u>				-	<u> </u>	_	-	٠,				 		-			-
WI - Wipe X - Other	ļ						┼	<u> </u>		<u> </u>			+-	-	_	-	-		-		-			 	_	-
F - Fish	<u> </u>	<u> </u>				<u> </u>	1			 	<u> </u>	-	-	┼		-	-			 	-		-		 	-
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Special Instruc	tlone:	<u>.t</u> .			*****		_1		/REVISIO	NS:								<u>. </u>		<u> </u>	Lloovi	lle tat	- I	y Use C	<u></u>	<u> </u>
		SAF	#	BOS.	-020			Μę	<u>-r0</u>	1. <u>RC</u>	<u>RA +</u>	<u>B</u> e,	<u>B.C</u>	r Wa	<u>, M</u>	<u>n M</u>	O. N.	<u>, V, Z</u>	^ s	amoles	were:	7		moer Re		ani wac
										2. ICFL						IN3A	12, I	Ð	1)) Shipp	ed	_ or	1)	Presen	n(a) O	uter
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•									-02	5. Cont		BGN	A	41	DHE	6X			3) Recei	ived <u>in</u>	Good	٠,) F18361		ampia or N
					•					•		B. BI 13.							1	Condition Cor N 4) Samples			4 S	4) Unbroken on Sample (Y) or N		
Relinguishe	d	Receive	:d		Т		elinqu	Ished	- -	6 Received			T		Die	CIADAC	cies Bel	ween			Preser	ved or N	C	OC Rec	cord Pr	esent
by		by	··	Date	Tim	•	by		<u> </u>	by	0016	Date i IN	<u> </u>	me	San	npies L	abeis a	ind _			ived Wi		U	lpon Sai		lec't or N
tell Ep	Ex V-Kerner 4-3002 (205 COMPOSITE DEMOLTES:										, t	iolding	Times	or N		ooler	1.5	°C								
			σ					WA	STE		175 141	711	<u> </u>	•	79	705	150	2/1	76	/			<u> </u>			

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Bechtel Hanfo	rd Inc.	HAIN OF CUST	ODY/SAMPLE ANALYSIS REQUEST B02-050-01 Page							Page 1	of 2			
Collector R. Fahlberg/R. Nielson		Comp	any Contact ane Jacques	Telephor 372-9	ne No.			Project Coordia TRENT, SJ		Price Code	8N	Data Tur	naround	
Project Designation 216-Z-11 Ditch Borehole Sam	ples	Samp	ling Location) West					SAF No. B02-050		Air Quality 45 I			Days) \	
Ice Chest No. ERA -	800-50	Field EL	Logbook No. -1517-		COA B20CW5	674C		Method of Shipment Foderal Express						
Shipped To TMARECRA		I	e Property No. A	DZ C	48	8		Bill of Lading	ur Bill N	057	00			
Radioactive Potent	RDS/REMARKS		Preservation	Cool 4C	Cool 4C	Cool 4C	Cool	4C Cool 4C	- Cool 40	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
		L7	Type of Container	₽Ğ	a.G	aG	P	aG	a.G	aG	a G	aG	aG	
Special Handling and/or			No. of Container(s)	1	1	1	1	i	1	1	i	1	1	
C00	oL		Volume	120mL	250mL	120mL	1000	mL 120mL	250mi	- 120mL	250mL	250mL	250mL	
SAMPLE ANALYSIS					See item (2) i Special Instructions	Hex - 7196	See item Spec Instruct	iai D1385	PCRs - 80	Pesticides - 8081	Herbicides - 8150A	See item (4) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015 (Methanol)	
Sample No.	Matrix *	Sample Date	Sample Time											
B14DJ8	SOIL	4-23-0	1240	X	X	X	λ	' X	X	X	Χ̈́	X	_ X	
			-	<u> </u>	 	_	<u> </u>		 					
							-		-			 	<u> </u>	
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CHAIN OF POSSESSIO		Sign/Pri				CIAL INSTR		ONS	I	· <u>·</u>	<u> </u>	<u> </u>	Matrix *	
Relinquished By/Removed From Relinquished By/Removed From	Date/Time DA	Rest 1	A 4.23.00	Mc/Time	i	Metals by ICP (TCLP) -	1311/6010 {Arsenic,	Barium, C	admium, Chromiur	Lead ny Selenium, S	iilver};	3=Soil Sii=Sodinast SO=Solid	
Relinquished By/Removed From Relinquished By/Removed From Relinquished By/Removed From Relinquished By/Removed From	ate/Time ate/Time ate/Time ate/Time	1CF Mo (3) (4)	? Metals - 6010A olybdeaum, Nicke IC Anions - 300 VOA - \$260A (' Add-On) (Tetral Personna relinguis	10A (Supertre (Supertre I, Vanadi 0 (Fluor TCL); Vonydrofurati el not av ili samo	sertrace) (Arsenic, Bi ace Add-On) (Berylli ium, Zinc); Mercury ide, Nitrate, Sulfate) DA - 8260A (Add-On	um, Boron - 7470 - (C ; Ammonia) (Trichlor	i, Copper, Magnesia CV) i - 350.31 NO2/NO	um, Manganes 3 - 353 1: Sulo	c,	Si-Sludge W = Water O=Oil A-Adr DS-Drum Solids DU-Drum Liquide T-Timus WI-Wipe L-Liquid V=Vegetation X=Other				
LABORATORY Received By SECTION					litle	<u> </u>						Date/Time	1	
FINAL SAMPLE Disposal Method DISPOSITION						Disp	osed By					Date/Time		

Bechtel Hanford Inc.	CI	HAIN OF CUST	ODY/S	AMPI	LE A	NAL	YSIS	RE	EQUEST		B02	2-050-01	Page 2	of 2
Collector R. Fahlberg/R. Nielson		ny Contact ne Jacques	Telephor 372-9						ject Coordinate ENT, SJ	r Pi	rice Code	8N	Data Tur	naround
Project Designation 216-Z-11 Ditch Borehole Samples		ng Location West	***						F No. 2-050	Ai	ir Quality		45 I	Days (J)
Ice Chest No. ERC 62-008		ogbook No. 1517-	B20CW5674C Feder					Method of Shipment Foderal Express						
Shipped To TMA/RECRA	Offsite	Property No. A	かての	18	8			ВЩ	l of Lading/Air	WN.	en	SPC		
Possib le sam ple hazards/remarks		7		1		art un	1					7	Ī —	
Radioactive Potential		Preservation	Cool 4C	Cool 40	c Z	(P.1.	Nan	FT.	4.02					
Radioactive Potential TIETO BI4DL7 Special Handling and/or Storage		Type of Container	ъG	aG			a.G							
		No. of Container(s)	1	1	ŀ	t	1							
Cool		Volume	250mL RJN 4-16	120ml	L I	00mL	120n		416102					
			See item (1) in Special 5		sel Sec	m (2) in			1002	·		<u> </u>		
Sample analysis			Instructions.		D: Ins	buctions.	Instruct							
				Range WTPH-										
Sample No. Matrix * Sam	ple Date	Sample Time												
B14DJ8 SOIL U-1	13-0°	2 1240	X	X		Х	$ _{\lambda}$			************				
CT VI OF POSSESSES	C1 450 :			<u> Т</u> ,_							<u>l</u>	<u> </u>		
CHAIN OF POSSESSION Relinquished By/Removed From Date/Time 1647 Received Processing Control Processing Cont	Sign/Prin ved By/Stor		ate/Time	s	PECIAL See COC o	omments		ONS						Matrix *
Rotalle Rf Liber 4.23.02 18	x 1	A 4. 23.0	ع اح) N. 4-16-0 (1) Semi-'		70A (TC)	L); Se	mi-VOA 8270A ((Add-Cn)	{1,2,4-Trimeth	ylbenzene, Cy	clohexanone,	S=Soil SE=Sedimont SO=Solid
Resinquished By/Removed From Date/Time US Concert OL 1A 3728 4.2902	digysiq	ed in RThors			Inbutyi ph	osphate)	omplete.	Ces	imory - 1.5 im-134, Cesium-13	17 Cobalt	60 Eurosian	TSZ HISOOUR	er-du	31=8ludgs W = Water
Religion By/Remove Flore C Date/Time D DC Rest	ved By/Stor	editor O O	aic/Jime 4		incoium.	155. Niol	 0 4	Padin	m 226, Radium 226 um 89,99 — Total 6). Istituai	C THERIUM (I II	Triumatana C	Acres de	Q=Oil A=Air
KICL PRO 4287	1,00	1-EU 2	ate/Time	<u>þ</u> €	(2) Lotopi (1:dd on)	o Plutori	an, du	T ENT	1-241/Curlum-244	- Americin	m-241); Ameri	cium 241/Cuci	um 24/	DS=Drum Solids DL=Drum Liquids T=Tissue
Religioushed By/Romoved From Date/Time Recei	ved ByrKla	energy is -30-		5		-						K	1.24.22	WI-Wips L-Liquid
	ved By/Sto	red in D	ate/Time			Perso reling	nnel no uish.sa	t ava mole	illable to	+				V=Vegetation X=Otiler
Relinquished By/Removed From Date/Time Recei	ved By/Sto	red In D	ate/Time			Ref#	<i>1 </i>	on_	25 from the 3728) 				
LABORATORY Received By SECTION			Т	itte		• •							Date/Time	<u> </u>
FINAL SAMPLE Disposal Method DISPOSITION						Disp	osed By			<u> </u>			Date/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD
Purchase Order/Project:

DATE: 4.30.02

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG #: 02041529

	ALL ENTRIES MARKED "NO" MUST BE				<u> </u>
1.	Custody seals on coolers or shipping container intact, signed and dated?	D∤Yes	□ No	□ N/A	See Comment
2.	Outside of coolers or shipping containers are free from damage?	D) Yes	□ No	□ N/A	see Comment
3.	Airbill # recorded?	T Yes	□ No	□ N/A	☐ see Comment i
4.	All expected paperwork received (coc and other client specific; historical data, alpha/beta or other screening data as	D Yes	· □ No	□ N/A	. See Comment #
	applicable)? (paperwork sealed in plastic bag and taped to inside lid)				
5.	Sample containers are intact?	□ Yes.	□ No	□ N/A	□ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	□ y es	□ No	□ N/A	☐ see Comment s
7.	All samples on coc received?	DX es	□ No	□ N/A	see Comment i
8.	All sample label information matches coc?	□,¥€s	□ No	□ N/A	See Comment
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	⊒ yes	□ No	□ N/A	see Comment
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	T Yes	□ No	□ N/A	See Comment i
11.	Where applicable, bar code labels are affixed to coc?	□ Yes .	DNo .	DWA	see Comment i
12.	coc signed and dated?	√D Yes	□ No	O N/A	☐ see Comment i
13.	coc faxed or emailed to client?	□ Yes	□ No	□ N/A	see Comment &
	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	See Comment &

Cooler # / temp and Comments:

008

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:

Viet Howing



Lionville Laboratory, Inc. HBGX ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1760

DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID	ΓΛΓ	#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14DJ8	001		s	02LE0491	04/23/02	05/03/02	05/05/02
B14DJ8	001	MS	s	02LE0491	04/23/02	05/03/02	05/05/02
B14DJ8	001	MSD	s	02LE0491	04/23/02	05/03/02	05/05/02
LAB QC:							
PBLKNT	MB1		s	02LE0491	N/A	05/03/02	05/05/02
PBLKNT	MB1	BS	s	02LE0491	N/A	05/03/02	05/05/02

Alastralia-



Analytical Report

Client: TNU-HANFORD B02-050

LVL #: 0204L529

SDG/SAF#: H1760/B02-050

W.O.#: 11343-606-001-9999-00

Date Received: 04-30-2002

HERBICIDE

One (1) soil sample was collected on 04-23-2002.

The sample and its associated QC samples were extracted on 05-03-2002 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 05-05-2002. The extraction and analysis procedures were based on method 8151A.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLl's sample acceptance policy with the exception of cooler temperature, which has been recorded on the chain of custody.
- 2. The required holding time for extraction and analysis was met.
- 3. The method blank was below the reporting limits for all target compounds.
- 4. All surrogate recoveries were within client specified acceptance criteria.
- 5. All blank spike recoveries were within client specified acceptance criteria.
- 6. All matrix spike recoveries were within acceptance criteria.
- 7. All initial calibrations associated with this data set were within acceptance criteria.
- 8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

 $som \verb|\| r: \verb|\| data \verb|\| herb \verb|\| tnu \verb|\| 04t529. doc$

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.



GLOSSARY OF PESTICIDE/PCB DATA

4TA QUALIFIERS

- Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 31.
- This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- nterference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- Dl = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF PESTICIDE/PCB DATA

- This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form 1 and flagged with a "P".
- This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

Herbicides, Special List

RFW Batch Number: 0204L529 Client: TNUHANFORD B02-050 H1760 Work Order: 11343606001 Page: 1 Cust ID: B14DJ8 B14DJ8 B14DJ8 PBLKNT PBLKNT BS Sample RFW#: 001 001 MS 001 MSD 02LE0491-MB1 02LE0491-MB1 Information SOIL SOIL SOIL SOIL Matrix: SOIL D.F.: 1.00 1.00 1.00 1.00 1.00 Units: ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg DCAA 101 ł 97 🐐 71 * 88 % 73 Surrogate: 36 U 2.4-D 111 ¥ 83 Ł 33 U 86 뫔 2,4,5-TP (Silvex) 18 U 123 ł 92 % 17 U 89 ¥ 2,4,5-T 18 U 107 % 103 % 17 ט 106 %

gent Juli-

Report Date: 05/10/02 08:2

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Custody Transfer Record/Lab Work Request Page _____of___ Lionville Laboratory Use Only FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS 02046529 B02-050 Refrigerator # Licuid Est. Final Proj. Sampling Date _ #/Type Container Project # 113 43-606-001-9999-00 Solid Liquid Project Contact/Phone # Volume 05 Lionville Laboratory Project Manager _ Preservatives 3/CC 540 **ORGANIC** ANALYSES REQUESTED 5-30-05 4-30-02 Date Rec'd Date Due Lionville Laboratory Use Only Matrix MATRIX HYZN QC CODES: OGCSC Time Date Chosen 3 Matrix Client ID/Description S - Soil Collected Collected (V) SE - Sediment SO - Solid MS MSD SL - Sludge 4-23-07 W - Water 1240 Oil Air BILLDIB DS - Drum Solids DL - Drum Liquids EP/TCLP Leachate Wipe X - Other F - Fish Labehhon DATE/REVISIONS: Special Instructions: Lionville Laboratory Use Only SAF # BO2-050 METO, RCRA + Be, B, Cu, Mg, Mn, Mo, Ni, V, Zn Samples were: Tamper Resistant Seal was THORGO 2 ICFL. ICHO3 ICSO4, INHON INONE, ISFD 1) Shipped ____ or 1) Presencon Outer Hand Delivered Package Y or N OGCSC 3 Alcohols, Gh cols + Ketones 2) Unbroken on Outer Package Y or N 5-1-02 4 Conal 8624X NYSIO LLA 2) Ambient or Chille 3) Present on Sample 3) Received in Good 5-7-02 5 Concl OHBGN Add DHBGX Condition Cor N 4) Unbroken on 4) Samples Sample Y or N Property Preserved **COC Record Present** Relinquished Received Relinguished Received Discrepancies Between (7) or N Time Upon Sample, Rec't

COMPOSITE

Discrepancies Between or N Upon Sample Rec't Samples Labels and S) Received Within COC Record? Y or N Holding Times Cooler Temp. 1.5 °C

02046529

Bechtel	Hanford Inc.	HAIN OF CUST	USIODY/SAMPLE ANALISIS REQUEST DOZUM							Page 1	of <u>2</u>			
Collector R. Fahlberg/R. Nic		Comp	any Contact me Jacques	Telepho 372-9	ne No.			Project Coordi TRENT, SJ		Time come OIA			maround	
Project Designation 216-Z-11 Ditch Bo			ling Location West					SAF No. B02-050		Air Quality	Days			
Ice Chest No.	20-02-008	Field I	Logbook No. 1517-		COA B20CW5	674C		Method of Shipment Federal Express						
Shipped 10 TMARECRA			e Property No. A C	07.C	48	8		Bill of Lading	Ur BUI N	05	pc			
Radioactive Do	LE HAZARDS/REMARKS TEATILL		Preservation	Cool 4C	Cool 4C	Cool 4C	Cool	4C Cool 4C	Cool 40	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
ー	ie to 8140	L7	Type of Container	₄ G	øG	₽ G	P	a.G	aG	eG	∎G	aG	aG	
Special Handling			No. of Container(s)	1	1	1	1	1	ì	1	1	1	1	
	COOL		Volume	120mL	250mL	120mL	1000	mL 120mL	250mL	120mL	250mL	250mL	250mL	
	See item (1) is Special Instructions.	See item (2) i Special Instructions	Hex - 7196	See item Speci Instruct	ial D1385	PCBs - 80	Pesticides - 8081	Herbicides - 8150A	See item (4) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015 (Methanol)				
Sample No	. Matrix *	Sample Date	Sample Time											
B14DJ8	SOIL	4-23-0	2 1240	Χ	X	X	X	′ X	Χ	X	X	X	Χ	
					 	-	 —					 		
CHAIN OF PO	OSSESSION	Sign/Prin	f Names		Gma	L INCEP		N. C.				<u></u>	No a feet	
Relinquished By/Removed From Pate/Time Date/Time Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time Received By/Stored In Date/Time						remy (TCLP) - 1: ICP Metals - 601 Metals - 6010A lybdenum, Nicke 1C Anions - 300. VOA - 8260A (1 Add-On) {Tetralr Personne relinquist Ref #	on SAF FCLP) - 1 811/7/470 10A (Supertra I, Vanadii 0 (Fluori FCL); VC ydrofurau I not av	i311/6010 {Arsenic, Bacertrace) {Arsenic, Bacer Add-On) {Beryllium, Zinc}; Mercury de, Nitrate, Sulfate}; A - 8260A (Add-On)	rium, Cadri im, Boron, - 7470 - (C Ammonia {Trichloro	nium, Chromism, Copper, Magnesi V) - 350.3: NO2/NO	Lead, Selenium, Manganesu 3 - 353.1; Sulfi ane}; VOA - 82	n, Silver); R, des - 9030 260A (App	Matrix * S=Soil 38=Solid 38=Solid 38=Solid 30=Solid 30=Solid W=Water O=Oil A=Air D=Drum Liquids D=Drum Liquids T=Tisme W=Wips L=Liquid V=Vegetation X=Other	
FINAL SAMPLE Disposal Method DISPOSITION						Dispo	sed By					Date/Time		

Bechtel	Hanford Inc.	C	HAIN OF CUST	CODY/S	SAMPLE	ANAL	YSIS	REQUEST	В	02-050-01	Page 2	of <u>2</u>
Collector R. Fahlberg/R. Niels		Compa	any Contact ne Jacques	Telepho 372-9	ne No.			Project Coordinator TRENT, SJ	Price Code	8N	Data Tur	rnaround
Project Designation 216-Z-11 Ditch Bor		Sampli	ing Location West					SAF No. B02-050	Air Quali	ty 🗆	45]	Days
Ice Chest No.	2002008	Field I	Logbook No. 1517-		COA B20CW56	74C		Method of Shipment Federal Express				
Shipped To TMARECRA			Property No.	pzo	088	- تح 		Bill of Lading/Air Bill	se c	SPC		
1	E HAZARDS/REMARKS		,			21640	4 1	44.02				}
Radioactive Pb	tential	i	Preservation	Cool 4C	Cool 4C	IXP.	Non	4+4.00				
Special Handling	e TO BI4DL and/or Storage	7	Type of Container	aG	aG		aG		_			
i .	اممرا	İ	No. of Container(s)	1	1		1					
			Volume	250mL Rンペ 4-16	120mL -02.	1000mL		OL WHO 102				-
	SAMPLE ANAL	YSIS		See item (1) is Special 5 Instructions.		See item, (F) in Special (C Instructions.	See item Speci Instruct	<u>id</u> ?				
Sample No.	Matrix *	Sample Date	Sample Time									
B14DJ8	SOIL	4-23-01	2 1240	X	_ X	X	*		****			
			*									
CHAIN OF PO Relinquished By/Remove TRALLE Respunshed By/Remove	Prom Date/Time (6,7	Sign/Print Received By/fur	±10 Di	ate/Time	Sec C RIN4- FUT SI	IAL INSTR OC comments (6-02- emi-VOA - 827	on SAF 70a (TCL	.): Semi-VOA 8270A (Add	-On) {1,2,4-Trime	shylbenzene, Cycl	oheranone,	Matrix * s=soil sn=sediment so=solid
Religiblished By/Removes	-3728 4.790 Fine Chate/Time 082	21 14 .Y (TED 2	ate/Time	PO Nopto	wa 155, 190b	144, 04, 0 hal 63, 0 m, Amel	Astimp14 - [25] [Cosium-134, Cosium-137, G adium-236, Radium-228), It aminim-99,00 - Total S., Te [Jun-241/Curium-244 (Am	otopic Therium (1 shoulden 22. Triti	(Birlian s 251) ; Ce lum - 115 ; Isotopie rzicium 241/Ouziu	thereign Limited m-24	SI-Sludge W = Water OOil AAir DS-Drum Solids DL-Drum Liquids TTimme
Relinquished By/Remove	4.30-02 1005	Received By/Ston	condit-30		5	Person reling	nael aot Uish san	available to		K1 4	,z4.2e	WieWips L=Liquid V=Vegetation X=Other
Relinquished By/Remove	d From Date/Time	Received By/Store	ed In Do	ate/Time		Ref#	11-	nples from the 3728				ļ
LABORATORY SECTION	Received By			Ti	itle					D	ate/Time	
FINAL SAMPLE DISPOSITION	Disposal Method	The state of the s				Dispo	sed By			D	Date/Time	p***

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD Purchase Order/Project:

DATE: 4.30.02

SAF# / SOW# / Release #: BOZ - 050

Laboratory SDG #: 02041529

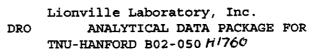
TE:	ALL ENTRIES MARKED "NO" MUST BE E	EXPLAIŊED II	N THE COMM	IENT SECTION	1
1.	Custody seals on coolers or shipping container intact, signed and dated?	Ωi≯Yes	□ No	□ N/A	D see Comment
2.	Outside of coolers or shipping containers are free from damage?	DX es	□ N ₀	□ N/A	C) see Comment
3.	Airbill # recorded?	□ Yes	□ N ₀	□ N/A	☐ see Comment
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as	D) es	. DNo	□ N/A	□ see Comment
	applicable)? (paperwork sealed in plastic bag and taped to inside lid)				
5.	Sample containers are intact?	U Yes	· D No	D N/A	☐ see Comment
6.	Custody seals on sample containers intact, signed and dated?	D.Yes	□ No	□ N/A	☐ see Comment
7.	All samples on coc received?	DX es	□ No	□ N/A	☐ see Comment
8.	All sample label information matches coc?	علاتِ	□ No	□ N/A	See Comment
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	E Yes	□ No	□ N/A	☐ see Comment
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	W Yes	□ No	□ N/A	see Comment
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	D)N/V	☐ see Comment
12.	coc signed and dated?	√Z Yes	□ No	□ N/A	See Commen
13.	coc faxed or emailed to client?	□ Yes	□ N ₀	□ N/A	Sec Commen
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	see Commen

Cooler # / temp and Comments:

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:



S 02LE0477

S 02LE0477

N/A

N/A

DATE RECEIVED: 04/30/02

LVL #

001

MB1

MB1 BS

001 MS

001 MSD

CLIENT ID

B14DJ8

B14DJ8

B14DJ8

LAB QC:

BLK

BLK

			PAT TOT #	020411323000
MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
s	02LE0477	04/23/02	05/01/02	05/05/02
S	02LE0477	04/23/02	05/01/02	05/05/02
s	02LE0477	04/23/02	05/01/02	05/05/02

05/01/02

05/01/02 05/05/02

05/05/02



Analytical Report

Client: TNU HANFORD B02-050

LVL#: 0204L529

SDG/SAF#: H1760/B02-050

W.O.#: 11343-606-001-9999-00

Date Received: 04-30-2002

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 04-23-2002.

The sample and its associated QC samples were prepared on 05-01-2002 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 05-05-2002. The analysis met the intent of method WTPH-D.

- 1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy with the exception of a cooler temperature, which has been recorded on the chain of custody.
- 2. The required holding time for extraction and analysis was met.
- 3. The method blank was below the reporting limits for all target compounds.
- 4. All surrogate recoveries were within acceptance criteria.
- 5. The blank spike recovery was within acceptance criteria.
- 6. The matrix spike recoveries were within acceptance criteria.
- 7. All initial calibrations associated with this data set were within acceptance criteria.
- 8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

Som\r:\troup\data\dro\04L-529-tnu.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.



GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- **BSD** = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF DIESEL RANGE ORGANICS DATA

- **D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.

DIESEL RANGE ORGANICS BY GC

Client: TNU-HANFORD B02-050 # 1760 Work Order: 11343606001 Page: 1 RFW Batch Number: 0204L529 B14DJ8 B14DJ8 BLK BLK BS Cust ID: B14DJ8 Sample 001 MS 02LE0477-MB1 02LE0477-MB1 RFW#: 001 001 MSD SOIL Information SOIL SOIL SOIL SOIL Matrix: D.F.: 1.00 1.00 1.00 1.00 1.00 mg/kg mg/kg mg/kg Units: mq/kg mg/kg p-Terphenyl 95 * 83 % 78 8. 94 67 % Diesel Range Organics 12.0 U 68 72 % 12.0 U 12.0 U 12.0 U 12.0 U Motor Oil 12.0 U 12.0 U

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Report Date: 05/06/02 09:50

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Custody Transfer Record/Lab Work Request Page of Lionville Laboratory Use Only FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS 02046529 B02-050 Retrigerator # Liquid Est. Final Proj. Sampling Date #/Type Container Project # 113 43-606-001-9999-00 Llouid Project Contact/Phone # Volume 120 250 05 Lionville Laboratory Project Manager oc spec JO Non **Preservatives** 500 **OFIGANIC** ANALYSES REQUESTED 5-30-05 4-30-02 Date Rec'd _ **Date Due** Lionville Laboratory Use Only Matrix MATRIX QC OGCSC CODES: Time Date Lab Chosen Matrix Client ID/Description S - Soil Collected Collected (V) SE ~ Sediment SO - Solid MS MSD SL - Studge 4-23-07/240 Water Oil 0 -- Drum Solids Drum Liquida EP/TCLP Leachate Wipe Other Fish See Labehnon DATE/REVISIONS: Special Instructions: Lionville Laboratory Use Only BO5-020 RCRA + B. B. Cu, Mg, Mn, Mo, N. V. Zn Samples were: Tamper Resistant Seal was: TAMORGA 2 ICFL, ICHO3 ICSO4, INHON, INDN2, ISFD 1) Shipped ____ or 1) Present on Outer Hand Delivered . Package Y or N OGCSC 3. Alcohols, Gh cols + Katone 2) Unbrokerron Outer Package Y or N 2) Ambient or Chille 3) Present on Sample 3) Received in Good 5-7-02 5 Concl OHDGN Add DHBGX Condition Cor N 4) Unbroken on 4) Samples Sample (Y) or N Property Preserved **COC Record Present** Relinguished Relinquished Received Received Discrepancies Between (r) or N Date Time Date Upon Sample Rec't Samples Labels and 5) Received Within COC Record? Y or (N) Holding Times COMPOSITE NOTES: (Ŷ) or N

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WASTE

02046569

College of Contribution Charactering 177.3/5/51 Telephone No. TRAPSCO A Transference 177.3/5/51 Telephone No. Transference 177.3/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5	Bechtel	Hanford Inc.	C	HAIN OF CUST	TODY/S	SAMPI	LE ANA	LYSIS	REQUES	T_		B02-050-01	Page 1	of <u>2</u>
Project Prospection Sample Sample Co. Safe No.	elson								inator	Price Cod	e 8N	Data Tu	rnaround	
Strong Food	Project Designation		Samp	ling Location							Air Qua	lity 🗆	45	Days
Statipular Prosecution Offster Property No. A 7	Ice Chest No.	R1-02-008	Field EL				/5674C							
Preservation Cod 4C Cod	Shipped 16			e Property No. A	カファ	MR	8	<u> </u>	Bill of Lading	Air BIII	Nº 03	SPC		
Special Handling and/or Storage COOL Type of Containers all 10 storage No. of Containers all 10 storage No. of Containers (s) Volume See the (1) is storage No. of Containers (s) Volume See the (1) is storage See the (1) is storage See the (1) is storage See the (1) is storage Sample No. Matrix * Sample Date Sample Date Sample Time See the (1) is storage Sample No. Matrix * Sample Date Sample Time See the (1) is storage See the (1) is	POSSIBLESAMP	LE HAZARDS/REMARKS		T 7		7						ł		
Special Handling and/or Storage Type of Container() 1 1 1 1 1 1 1 1 1	Radioactive Po	tential	ı —	Preservation	Cool 4C	Cool 40	Cool4C	Cool	I4C Cool4C	Cool	C Cool	C Cool 4C	Cool 4C	Cool 4C
No. of Constalence(s) Volume 120ml. 250ml. 120ml.	1	- · ·	GT	Type of Container	aG	aG	a.G	P	a.G	a/G	a.G	aG	a.G	aG
SAMPLE ANALYSIS See inse (1) in See inse (2) in Special Inter-196		_ -		No. of Container(s)	1	1	1	1	1	l	1	1	1	l
SAMPLE ANALYSIS Seporial Intervendents Disposition		COOL		Volume	120mL	250mL	120mL	1000	mL 120mL	250m	L 120m	L 250mL	250mL	250mL
B14DJB SOIL U-23-02 240 X X X X X X X X X X X X X X X X X X X		SAMPLE ANALY	YSIS	L	Special	Special	Hex - 719	Spec	D1385	PCBs - 1			Special	Citycols, & Ketones - 8015
CHAIN OF POSSESSION Sign/Print Names Relinquished By/Removed From Date/Time 1	Sample No	o. Matrix *	Sample Date	Sample Time										
Relinquished By/Removed From Date/Time 1.5 Received By/Stored In Date/Time 1.5 Received By/Stored	B14DJ8	SOIL	4-23-0	2 1240	Х	X	X	λ	/ X)	< x	X	Χ	X
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Relinquished By/Removed From Date/Time 1.5 Received By/Stored In Date/Time 1.5 Received By/Stored In Date/Time 1.5 Date/Time Date/Time					<u> </u>			 					<u> </u>	
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	Relinquished By/Remove Relinquished By/Remove Relinquished By/Remove Relinquished By/Remove Relinquished By/Remove LABORATORY	ed From Dete/Time 16.15 A 2 3 0 Dete/Time 16.15 A 2 3 0 Dete/Time 16.15 Dete/Time 16.15 Dete/Time 16.15 Dete/Time 16.15 Dete/Time 16.15 Dete/Time 16.15	Received By/Stor	ad In Thord	MISTIME LIZE Ste/Time Ste/Time OL I Ste/Time ste/Time	Section (1) MM (2) (2) (2) (3) (4) (4) (5) (5) (5) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6	be COC comments Metals by ICP (ercusy (TCLP) - ICP Metals - 6010 olybdenum, Nico IC Anions - 36 VOA - 8260A K Add-On) (Tetr	(TCLP) -: 1311/7470 01QA (Supertra cel, Vanadi 0.0 (Fluor (TCL); VC uhydrofurar	1311/6010 (Arsenic, Esca Add-On) (Beryllum, Zinc), Mercuryide, Nitrate, Sulfate OA - 8260A (Add-On)	arium, Cac ium, Boros - 7470 - (c ; Ammoni a) (Trichlo	lmium, Chromi n, Copper, Mag CV) a - 350 3: NO2	mium Selenium, S uum, Lead, Seleniu nesium, Manganes /NO3 - 353. 1; Sulf nethane}; VOA - 8	m, Silver}; e, ides - 9030 260A (App	S=Sail SIS-Stodiment SO=Stolid SI=Stodge W = Water O=Oil A=Air DS=Druna Solids DI=Druna Liquids T=Tisane WI=Wipe L=Liquid V=Vagetation
	FINAL SAMPLE DISPOSITION	Disposal Method			****		Dis	posed By					Date/Time	<u> </u>

Bechtel Hanford Inc.	C	IAIN OF CUST	ODY/S	SAMPLI	E AN	AL	YSIS	5 F	REQUEST			B02	-050-01	Page 2	of <u>2</u>
Collector R. Fahlberg/R. Nielson	Comp	ny Contact ne Jacques	Telepho 372-9	ne No.				P	roject Coordir RENT, SJ	ator	Price C	Code	8N	Data Tu	
Project Designation 216-Z-11 Ditch Borehole Samples		ng Location West							AF No. 302-050		Air Q	uality		45	Days
Ice Chest No. FRC 62-008		ogbook No. 1517-		COA B20CW50	574C			Т	lethod of Ships Federal Expres	3					
Shipped To TMA/RECRA	Offsite	Property No. A	8Z0	088	3			ļ	Bill of Lading/	<u>т ВШ 1</u>	<u>8</u> e	0	PC		
POSSIBLE SAMPLE HAZARDS/REMARKS	-	7			M	JÓ	- 1		1						
Radioactive Potential		Preservation	Cool 4C	Cool 4C	W	۶. ۲.			17402				:		
TIETO BI4DL7 Special Handling and/or Storage		Type of Container	aG	aG			1	G							
1 .		No. of Container(s)	1	1	1 1		1 1	1	_						<u> </u>
Cool		Volume	250mL ぬいサード	120mL	1000	mL 4-4		mL) ni 416/02					-	
			See item (1)	a TPH-Diesel	See it on		See iles	n (P)	(an			V			
SAMPLE ANALYSIS			Special 5 Instructions	WTPH-D;	Instance	tions.	Instru	ction							
SAPILLE AVALLESIS			Ì	TPH-Gasoline Range -	1				1		- 1				
				WIPH-G	1 1							i	i		
Sample No. Matrix * Sam	ple Date	Sample Time													
B14DJ8 SOIL U-1	3-0	2 1240	X	X	k	•	*	(
														_	
	ign/Prin				CIAL IN				s		*				Matrix *
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Resinquished By/Ramoved Fram Date/Time COO Refer	out wister	all Dillows	gy/lihe/	/プワノヘ I Trib	atvi nkosni	hatel		- 4	Semi-VOA 8276 Intimory -125				-		SO=Solid SI=Sludge
DOL 1A 3728 4.29021X	\	W=UND &	121	T	Dunma Sp		omplete	. B	csium-134, Cesium ium 336, Redium	. 127 Ca	belt 60, Ec	ropiuli-I	2, Europuan-	15%	W = Water O=Oil
Religious By Racket Flow C Date/Time D D Ready	Ston	TOO 0	id Jime 4	C 1~9 Nov	- 22	7 1	- 63 -	Gero.	man 89,99 - Tot	18: To	maker I-9	Tridest	-144 Israeia	Licenium	A=Air DS=Drum Solida
Religioushed By/Removed From Date/Time Receip	ed By/Stor	odin D	te/Time		l on) (Cu			ciici	un-241/Culum-2	- Angeles	-cmm-741	. America			DL=Drum Liquids T=Timus
Feel 20 4.30-02 1005 /	<u> 19/2</u>	condit-30	02 100	5						7+			-4	.z4.22	WI=Wips L=Liquid
Relinquished By/Removed From Date/Time Receiv	ed By/Stor	edin 🖒 Da	te/Time		P	erson	iaci ne	ot a	vailable to	$\leq \downarrow$					V=Vegetation X=Other
Relinquished By/Removed From Date/Time Received	ed By/Stor	ed In Da	ate/Time		R	ef#	117	On	les from the 3	2					
LABORATORY Received By SECTION			Т	itle		,							D	ate/Time	<u> </u>
FINAL SAMPLE Disposal Method DISPOSITION			, and a			Dispo	sed By			<u>,</u> .			E	ate/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD Purchase Order/Project:

DATE: 4.30.0ン

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG#: 02041529

			A (:-		
ī.	Custody seals on coolers or shipping container intact, signed and dated?	D) Y es	□ No	D N/A	☐ see Comment
2.	Outside of coolers or shipping containers are free from damage?	□X es	□ No	□ N/A	see Comment
3.	Airbill # recorded?	DYYes	□ No	□ N/A	see Commen
4.	All expected paperwork received (coc and other client specific; historical data, alpha/beta or other screening data as	Q X es	□ No	□ N/A	see Commen
	applicable)? (paperwork sealed in plastic bag and taped to inside lid)				
5.	Sample containers are intact?	D Yes	[°] □ N ₀	□ N/A	□ see Commen
6.	Custody seals on sample containers intact, signed and dated?	D. Yes	D No	D N/A	Sec Commer
7.	All samples on coc received?	DX es	□ No	□ N/A	see Commer
8.	All sample label information matches coc?	D.XE.	□ No	DNA	C see Commer
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	D Yes	□ N ₀	O N/A	D see Commer
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	U Yes	□ No	□ N/A	□ see Comme
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	Q MA	sec Comme
12.	coc signed and dated?	,⊿ Yes	□ No	□ N/A	see Comme
13.	coc faxed or emailed to client?	□ Yes	□ No	□ N/A	🗀 see Comme
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	🖸 see Comme

Cooler # / temp and Comments:

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:



DATE RECEIVED: 04/30/02

LVL LOT # :0204L529

CLIENT ID	LVL #	мтх	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14DJ8	001	S	02LE0493 02LE0493	04/23/02 04/23/02	05/05/02 05/05/02	05/05/02 05/05/02
B14DJ8 B14DJ8	001 MS	-	02LE0493	04/23/02	05/05/02	05/05/02
LAB QC:						
BLK BLK	MB1 MB1 BS	s s	02LE0493 02LE0493	N/A N/A	05/05/02 05/05/02	05/05/02 05/05/02

Ky 5/1/02



Analytical Report

Client: TNU HANFORD B02-050

LVL#: 0204L529

SDG/SAF#: H1760/B02-050

W.O.#: 11343-606-001-9999-00

Date Received: 04-30-02

GC SCAN

One (1) soil sample was collected on 04-23-02.

The sample and its associated QC samples were extracted and analyzed for Methanol on 05-05-02.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy
- 2. All required holding times for analysis have been met.
- 3. The method blank was below the reporting limits for all target compounds.
- 4. Surrogates are not currently employed in the methodology.
- 5. The blank spike recovery was within acceptance criteria.
- 6. All matrix spike recoveries were within acceptance criteria.
- 7. All initial calibrations were within acceptance criteria.
- 8. All continuing calibrations run prior to analysis for 2-ethoxyethanol were within acceptance criteria.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Deputy Laboratory Manager

Lionville Laboratory Incorporated

r:\group\data\gcsc\04L-529.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.



GLOSSARY OF GC SCAN DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



31106

GLOSSARY OF GC SCAN DATA

- P = This flag is used for an GC SCAN target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- **D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

The BANG

C = This flag applies to a compound that has been confirmed by GC SCAN.

GC SCAN

Report Date: 05/06/02 14:05 RFW Batch Number: 0204L529 Client: TNU-HANFORD B02-050 Work Order: 11343606001 Page: 1 Cust ID: B14DJ8 B14DJ8 **B14DJ8** BLK BLK BS Sample RFW#: 001 001 MS 02LE0493-MB1 02LE0493-MB1 001 MSD Information Matrix: SOIL SOIL SOIL SOIL SOIL D.F.: 1.00 1.00 1.00 1.00 1.00 Units: mg/kg mg/kg mg/kg mg/kg mg/kg Methanol 28 U 72 % 75 % 25 U 97 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

4gustabr

Lionville Laboratory Use Only
0204L529

Custody Transfer Record/Lab Work Request Page Cof

FIELD	PERSONNEL	COMPLETE	ONLY	SHADED	AREAS
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Project #		13 43	-606	- 001-	- 9999	-00			#/17P0		Solid	1,46-	146	146	116-	JAC-	/AG	IAG	[146-		IA4	IPC	/AC-	IAG-	2	
Project Conta									Volume	ì	Liquid	_			5-1	(2.3	200	770	7त				~ ~	45	4	
Lionville Labo			anager		0:	<u> </u>	· ·				Solid	d50	250	250	250	120	200	jou	0L70		120		250	120		·-
oc _5/60		Del5			3 0	da	41		Preserv	atives	ــــــــــــــــــــــــــــــــــــــ	_	ORG	ANIC			4 <i>(CO)</i>	11100	INC)RG	BRD	Te	740	Æ	4	
Date Rec'd	4.	30-02	D	ate Due	S-:	30-0	۲_		ANALY REQUE		-	VOA		PCB PCB	Herb	Est	qicot GULC KET	HROM	7, Meda je	ਨੁ	OKO	AN, IN	met	Morbins	2	
MATRIY		1					Mai	trix							1		Lionvi	ile La	borate	ory Us	e Only	/	1			
MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Studge	Lab ID	,	Clien	t ID/Descri	ption		Cho (+	C sen	Matrix	Date Collected		290	0625×	20 €CB	OHBGY	19040	06.050	LCR6	MET ()		02/50	INORED	TLAP	Nayha	RCRATTEM	
	001	314	/D:	18_			/	/	3	4-23-07	1240	1	1	1	1	1	1	1	1_			1	1	1		
A - Air DS - Drum	002	B147	820	tel	, oF 0	101	1	/	L	*																
Solids DL - Drum																ļ										
Liquids L · EP/TCLP																			<u> </u>							
Leachate WI - Wipe												<u> </u>												200		
X - Other F - Fish																		<u> </u>								
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Special Instruct	ions:	SAF	#	₿02-0	50			ME THOR OG S-1-	esc or	ns: 1. RC 2. ICFL 3. Alcol 4. Cana 5. Cana	, ICNO3 hols, G J 062	LC.	10 4. (; +	INH Keton	3N, U	ININ + N		•	- (1) H Ad 2)	amples Shippe and De intill #	were:	or	Ta 1) Pa 2) Pa 3)	we Or mper Resi Present ckage Unbrok- ckage Present	stant Se	uter N Outer N ample r N
Relinquished by	3	Receive	(2	Date 4-3002	Time	Re		shed	D\$ITE	6. Received by		ate	Ti	ne	Sam COO NOT	noles La C Recor TES:	ies Betrabels au	nd or (¶)	_ 4 P) Samp roperly) Recei lolding	les Presen Octoor	ved or N thìn	Sa Ca U Ca	OC Record San San San San San San San San San San	ord Pre Pord Pre Pole,Re	N esent

UQUIL VAT

Collector			ILLI OI COUL	<u>UD 17</u> S	WIATE.		MINAL	1212	<u>RE</u>	QUEST		DUL	-050-01	<u> </u>	of <u>2</u>
R. Fahlberg/R. Nielson	['	Compan	y Contact Jacques	Telepho 372-9	ne No.				Proje	ect Coordin NT, SJ	ator	rice Code	8N	Data Tun	naround
Project Designation 216-Z-11 Ditch Borehole Samples			g Location						SAF 1 B02-0		A	ir Quality		45 I	Days
Ice Chest No. FRA -02-	800	Field Lo	gbook No. 517-		COA B20CV		/4C			od of Shipn deral Expres					
Shipped 10 TMA/RECRA	1	Offsite I	Property No. A	カファ	HE	?	3		ВіШо	of Lading/A	ir Bill No.	051	DC		
POSSIBLE SAMPLE HAZARDS/REMA	RKS		• 7							Ţ	-		-		
Radioactive Potential Tie TO B			Preservation	Cool 4C	Cool 4	4C	Coal 4C	Coul	4C	Cool 4C	Coal 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
la contraction of the contractio	14007	Γ	Type of Container	аG	aG	i	аC	P		аG	aG	aG	aG	aG	aCJ
Special Handling and/or Storage		ľ	No. of Container(s)	l	1		1	1		1	1	1	1	1	1
CooL			Volume	120mL	250m	nL	120mL	1000s	mL	120mL	250mL	120mL	250mL	250mL	250mL
SAMI	PLE ANALYSIS			See item (1) is Special Instructions.	Speci	ial	Chromium Hex - 7196	See item Spec Instruct	ألفة	Hydrazine - D1385	PCBs - 8082	Pesticides - 8081	Herbicides - 8150A	See item (4) in Special Instructions.	Alcohois, Glycols, & Ketones - 8015 (Methanol)
			1 0 LT			******									
Sample No. Matr B14DJ8 SO	•	3-07	Sample Time		Х	•	./		/	· · ·	Х	Х	Х	\ \/	· /
50	1 4-a	.5-03	1240	 ^	+-^		X	- X				+-^-	 ^-	X_	X
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-															
CHAIN OF POSSESSION		n/Print					LAL INSTR		ONS						Matrix *
Riffeld Phille 4.2	3.02 Ret	By/otore	A 4.2302			(1) M		TCLP) -)10 (Arsenic, i	Batium, Cad	mium, Chromius	Lead of Selenium, S	ilver};	S=Soil SE=Solines SO=Solid
Robert 3728	ime OO Raceife	$1 \sim$		uc/Time C	1777	(2) IC	ury (TCLP) - 13 CP Metals - 601 Actals - 6010A	IOA (Sup	pertrace)) (Arsenic, Ba I-On) (Berylli	rium, Cadmi am, Boron, (ium, Chromium, Copper, Magnesi	Lead, Selenium um, Manganes	n, Silver); e,	SI=Sludge W = Water O=Oil
Rehinquished By/Removed Floor	U.2972	By/Store	yey "	ste/Time		Molyl (3) I	bdenum, Nicke C Anions - 300.	i, Venadi 0 (Fluor	ium, Zin ride, Niti	nc}; Mercury rate, Sulfate};	- 7470 - (CV Ammonia -	/) 350,3: NO2/NO	3 - 353.1: Sulfi	ides - 9030	A=Air DS=Drum Solids DL=Drum Liquids
Reliaquished BarRemoved From Date	The same of the sa	By/Store	d in D	ate/Time			'OA - 8260A (1 dd-On) {Tetrah			60A (Add-On)	(Trichloro	monotluorometh	anc}; VOA - 82	260A (App	T=Tissue WI=Wipe
Relinquished By/Removed From Date/		d By/Store		Oユー/ CC ate/Time	/		Personne	l not a	vailabl	le to					L=Liquid V=Vegetation X=Other
Relinquished By/Removed From Date/	Time Received	d By/Store	din D	ate/Time			relinquis Ref#	h samp on	nes fro	on the 3728 1241_0 2	?_				
LABORATORY Received By SECTION	1	-		· · · · · · · · · · · · · · · · · · ·	l'itle]	Date/Time	1
FINAL SAMPLE Disposal Method DISPOSITION						•	Dispo	sed By						Date/Time	

Bechtel Hanfo	ord Inc.	CI	HAIN OF CUST	ODY/S	AMPLI	E AN	ALY	YSIS	RJ	EQUEST		В	02-050-01	Page 2	of 2
Collector R. Fahlberg/R. Nielson			iny Contact ne Jacques	Telepho 372-9						oject Coordin ENT, SJ	ntor	Price Code	8N	Data Tur	naround
Project Designation 216-Z-11 Ditch Borehole Sa	mples		ing Location West							F No. 2-050		Air Quali	y 🗆	45 I	Days
Ice Chest No. ERC	62-008	Field I EL-	ogbook No. 1517-		COA B20CW56	674C]]	thod of Ships Federal Expres	S				
Shipped To TMARECRA		Offsite	Property No.	カフウ	188	3			Bil	ll of Lading/A	ir Bill N	3e c	SPC		
POSSIBLE SAMPLE HAZ	ARDS/REMARKS					٦ ا	10	_ 1							
Radioactive Potent	hal		Preservation	Cool 4C	Cool 4C	13	24.0	N	LF.	74.02		}]		
Special Handling and/or	BI4DL7	_	Type of Container	aG	aG		<u> </u>	10	3						
1			No. of Container(s)	1	1		†]'						•	:
Coo) 1		Volume	250mL RJN 4-16	120mL		0mL 4-€	120r		+ h 02					-
	SAMPLE ANALY	SIS		See item (1) ii Special 5 Instructions		See it Sp Lustr	un (T) in ecial (C actions.	See i em	i (a) in isi						
Sample No.	Matrix *	Sample Date	Sample Time												
B14DJ8	SOIL	4-23-0	2 1240	X	X		V.	1	-						
										<u> </u>				<u> </u>	
						╀-		<u> </u>		ļ	<u> </u>				
CIL TU OR NO CORRES		a		<u></u>				<u> </u>			<u> </u>			<u> </u>	
CHAIN OF POSSESSI Relinquished By/Removed From Relinquished By/Removed From	Date/Time (617	Sign/Prin Received By/for	edl) D	ate/Time	See RIN 5(1)	COC 00	mments - OA - 827		L); Se			n) (1,2,4-Trime	thylbenzene, Cy	clohexanone,	Matrix * S=5oil SE=Sedimus SO=5olid SI=Skudge
KellA3	728 47901	$11 \leftarrow 11$		100	92 X	Carren	Save C	omplete	:4Ces	sium-134. Cesiui	- 137 Col	oult 60, Europid	m-15Z, Europaun Morium-232), C	1-15-4	W = Water O=Oil
Relinition By/Rendvel F page	P Date/Time D 80	2 3 to 0 3 / Sto	TOD 9	ate time 4	CTU4 Nop	turium.	137, Ne	kul 63; t	digin.	iun 89,98 - To	al Gr; Tool		lun - 113, Isomp	- Umniya	A=Air DS=Dron Sulids
Religionated By/Removed From	Date/Time 30-02 1005	Received By/Stor	energy 30	ate/Time	() id		erium-2			F	<u>ـنــ</u>		2		DL-Drun Liquids T=Tisme WI=Wipe L=Liquid
Relinquished By/Removed From	Date/Time	Received By/Stor		ate/Time			Person relinq	nnel no uişl _ə sa	of grait	uilable to F	778				V=Other X=Other
Relinquished By/Removed From	Date/Time	Received By/Sto	red In D	ate/Time			Ref#	<i>]H</i>	on	es from the 3 4 /29 /0	2				
LABORATORY Received SECTION	Ву			T	itle									Date/Time	
FINAL SAMPLE Disposal DISPOSITION	Method						Dispo	sed By						Date/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD
Purchase Order/Project:

DATE: 4.30.0ン

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG #: 02041529

1.	Custody seals on coolers or shipping container intact, signed and dated?	Ū∕Yes	□ No	□ N/A	see Comment f
2.	Outside of coolers or shipping containers are free from damage?	DX es	□ No	□ N/A	see Comment
3.	Airbill # recorded?	D Yes	□ No	□ N/A	D see Comment
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as	Q.Yes	. D No	□ N/A	see Comment
	applicable)? (paperwork sealed in plastic bag and taped to inside lid)				
5.	Sample containers are intact?	□ Yes,	□ No	□ N/A	see Comment
6.	Custody seals on sample containers intact, signed and dated?	D X es	□ No	□ N/A	☐ see Comment
7.	All samples on coc received?	DXes /	□ No	□ N/A	see Comment
8.	All sample label information matches coc?	ا کالاتِ	□ N₀	□ N/A	see Comment
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	D Yes	□ No	□ N/A	see Comment
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	To Yes	□ No	□ N/A	see Comment
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DMA	D see Comment
12.	coc signed and dated?	√Z Yes	□ No	□ N/A	see Comment
13.	coc faxed or emailed to client?	□ Yes	□ No	□ N/A	see Comment
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	O N/A	see Comment

Cooler # / temp and Comments:

2008

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:

Vield Howedy



DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14DJ8						
TCLP	001	s	02LTO210	04/23/02	05/01/02	05/02/02
SILVER, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02
SILVER, TOTAL	001 RE	P S	02L0248	04/23/02	05/11/02	05/14/02
SILVER, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
ARSENIC, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02
ARSENIC, TOTAL	001 RE	P S	02L0248	04/23/02	05/11/02	05/14/02
ARSENIC, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
BORON, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02
BORON, TOTAL	001 RE	e s	02L0248	04/23/02	05/11/02	05/14/02
BORON, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
BARIUM, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02
BARIUM, TOTAL	001 RE	e s	02L0248	04/23/02	05/11/02	05/14/02
BARIUM, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
BERYLLIUM, TOTAL	001	s	02L0248	04/23/02	05/11/02	05/14/02
BERYLLIUM, TOTAL	001 RE	? s	02L0248	04/23/02	05/11/02	05/14/02
BERYLLIUM, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
CADMIUM, TOTAL	001	s	02L0248	04/23/02	05/11/02	05/14/02
CADMIUM, TOTAL	001 RE	e s	02L0248	04/23/02	05/11/02	05/14/02
CADMIUM, TOTAL	001 MS	s	02L0248	04/23/02	05/11/02	05/14/02
CHROMIUM, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02
CHROMIUM, TOTAL	001 RE	S	02L0248	04/23/02	05/11/02	05/14/02
CHROMIUM, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
COPPER, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02
COPPER, TOTAL	001 REF	S	02L0248	04/23/02	05/11/02	05/14/02
COPPER, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
MERCURY, TOTAL	001	S	02C0123	04/23/02	05/07/02	05/08/02
MERCURY, TOTAL	001 REF	S	02C0123	04/23/02	05/07/02	05/08/02
MERCURY, TOTAL	001 MS	s	02C0123	04/23/02	05/07/02	05/08/02
MAGNESIUM, TOTAL	001	s	02L0248	04/23/02	05/11/02	05/14/02
MAGNESIUM, TOTAL	001 REF	o s	02L0248	04/23/02	05/11/02	05/14/02
MAGNESIUM, TOTAL	001 MS	s	02L0248	04/23/02	05/11/02	05/14/02
MANGANESE, TOTAL	001	s	02L0248	04/23/02	05/11/02	05/14/02
MANGANESE, TOTAL	001 REF	s	02L0248	04/23/02	05/11/02	05/14/02
MANGANESE, TOTAL	001 MS	s	02L0248	04/23/02	05/11/02	05/14/02
MOLYBDENUM, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02

DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MOLYBDENUM, TOTAL	001 REP	s	02L0248	04/23/02	05/11/02	05/14/02
MOLYBDENUM, TOTAL	001 MS	s	02L0248	04/23/02	05/11/02	05/14/02
NICKEL, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02
NICKEL, TOTAL	001 REP	s	02L0248	04/23/02	05/11/02	05/14/02
NICKEL, TOTAL	001 MS	s	02L0248	04/23/02	05/11/02	05/14/02
LEAD, TOTAL	001	s	02L0248	04/23/02	05/11/02	05/14/02
LEAD, TOTAL	001 REP	s	02L0248	04/23/02	05/11/02	05/14/02
LEAD, TOTAL	001 MS	s	02L0248	04/23/02	05/11/02	05/14/02
SELENIUM, TOTAL	001	s	02L0248	04/23/02	05/11/02	05/14/02
SELENIUM, TOTAL	001 REP	s	02L0248	04/23/02	05/11/02	05/14/02
SELENIUM, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
VANADIUM, TOTAL	001	s	02L0248	04/23/02	05/11/02	05/14/02
VANADIUM, TOTAL	001 REP	S	02L0248	04/23/02	05/11/02	05/14/02
VANADIUM, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
ZINC, TOTAL	001	S	02L0248	04/23/02	05/11/02	05/14/02
ZINC, TOTAL	001 REP	S	02L0248	04/23/02	05/11/02	05/14/02
ZINC, TOTAL	001 MS	S	02L0248	04/23/02	05/11/02	05/14/02
SILVER, TCLP LEACHAT	002	W	02L0241	05/02/02	05/08/02	05/08/02
SILVER, TCLP LEACHAT	002 REP	W	02L0241	05/02/02	05/08/02	05/08/02
SILVER, TCLP LEACHAT	002 MS	W	02L0241	05/02/02	05/08/02	05/08/02
ARSENIC, TCLP LEACHA	002	W	02L0241	05/02/02	05/08/02	05/08/02
ARSENIC, TCLP LEACHA	002 REP	W	02L0241	05/02/02	05/08/02	05/08/02
ARSENIC, TCLP LEACHA	002 MS	W	02L0241	05/02/02	05/08/02	05/08/02
BARIUM, TCLP LEACHAT	002	W	02L0241	05/02/02	05/08/02	05/08/02
BARIUM, TCLP LEACHAT	002 REP	W	02L0241	05/02/02	05/08/02	05/08/02
BARIUM, TCLP LEACHAT	002 MS	W	02L0241	05/02/02	05/08/02	05/08/02
CADMIUM, TCLP LEACHA	002	W	02L0241	05/02/02	05/08/02	05/08/02
CADMIUM, TCLP LEACHA	002 REP	W	02L0241	05/02/02	05/08/02	05/08/02
CADMIUM, TCLP LEACHA	002 MS	W	02L0241	05/02/02	05/08/02	05/08/02
CHROMIUM, TCLP LEACH	002	W	02L0241	05/02/02	05/08/02	05/08/02
CHROMIUM, TCLP LEACH	002 REP	W	02L0241	05/02/02	05/08/02	05/08/02
CHROMIUM, TCLP LEACH	002 MS	W	02L0241	05/02/02	05/08/02	05/08/02
MERCURY, TCLP LEACHA	002	M	02C0120	05/02/02	05/02/02	05/03/02
MERCURY, TCLP LEACHA	002 REP	W	02C0120	05/02/02	05/02/02	05/03/02
MERCURY, TCLP LEACHA	002 MS	W	02C0120	05/02/02	05/02/02	05/03/02
LEAD, TCLP LEACHATE	002	W	02L0241	05/02/02	05/08/02	05/08/02
LEAD, TCLP LEACHATE	002 REP	W	02L0241	05/02/02	05/08/02	05/08/02
LEAD, TCLP LEACHATE	002 MS	W	02L0241	05/02/02	05/08/02	05/08/02

DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
						<u></u>
SELENIUM, TCLP LEACH	002	W	02L0241	05/02/02	05/08/02	05/08/02
SELENIUM, TCLP LEACH	002 REP	W	02L0241	05/02/02	05/08/02	05/08/02
SELENIUM, TCLP LEACH	002 MS	W	02L0241	05/02/02	05/08/02	05/08/02

LAB QC:

SILVER LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
SILVER, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
ARSENIC LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
ARSENIC, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
BORON LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
BORON, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
BARIUM LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
BARIUM, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
BERYLLIUM LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
BERYLLIUM, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
CADMIUM LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
CADMIUM, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
CHROMIUM LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
CHROMIUM, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
COPPER LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
COPPER, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
MERCURY LABORATORY	LC1 BS	S	02C0123	N/A	05/07/02	05/08/02
MERCURY, TOTAL	MB1	S	02C0123	N/A	05/07/02	05/08/02
MAGNESIUM LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
MAGNESIUM, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
MANGANESE LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
MANGANESE, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
MOLYBDENUM LABORATOR	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
MOLYBDENUM, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
NICKEL LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
NICKEL, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
LEAD LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
LEAD, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
SELENIUM LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
SELENIUM, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
VANADIUM LABORATORY	LC1 BS	S	02L0248	N/A	05/11/02	05/13/02
VANADIUM, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02

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LVL LOT # :0204L529

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC LABORATORY	LC1 BS	s	02L0248	N/A	05/11/02	05/13/02
ZINC, TOTAL	MB1	S	02L0248	N/A	05/11/02	05/13/02
SILVER LABORATORY	LC1 BS	W	02L0241	N/A	05/08/02	05/08/02
SILVER, TCLP LEACHAT	MB1	W	02L0241	N/A	05/08/02	05/08/02
SILVER, TCLP LEACHAT	MB2	W	02L0241	N/A	05/08/02	05/08/02
SILVER, TCLP LEACHAT	MB3	W	02L0241	N/A	05/08/02	05/08/02
ARSENIC LABORATORY	LC1 BS	W	02L0241	N/A	05/08/02	05/08/02
ARSENIC, TCLP LEACHA	MB1	W	02L0241	N/A	05/08/02	05/08/02
ARSENIC, TCLP LEACHA	MB2	W	02L0241	N/A	05/08/02	05/08/02
ARSENIC, TCLP LEACHA	MB3	W	02L0241	N/A	05/08/02	05/08/02
BARIUM LABORATORY	LC1 BS	W	02L0241	N/A	05/08/02	05/08/02
BARIUM, TCLP LEACHAT	MB1	W	02L0241	N/A	05/08/02	05/08/02
BARIUM, TCLP LEACHAT	MB2	W	02L0241	N/A	05/08/02	05/08/02
BARIUM, TCLP LEACHAT	MB3	W	02L0241	N/A	05/08/02	05/08/02
CADMIUM LABORATORY	LC1 BS	W	02L0241	N/A	05/08/02	05/08/02
CADMIUM, TCLP LEACHA	MB1	W	02L0241	N/A	05/08/02	05/08/02
CADMIUM, TCLP LEACHA	MB2	W	02L0241	N/A	05/08/02	05/08/02
CADMIUM, TCLP LEACHA	MB3	W	02L0241	N/A	05/08/02	05/08/02
CHROMIUM LABORATORY	LC1 BS	W	02L0241	N/A	05/08/02	05/08/02
CHROMIUM, TCLP LEACH	MB1	W	02L0241	N/A	05/08/02	05/08/02
CHROMIUM, TCLP LEACH	MB2	W	02L0241	N/A	05/08/02	05/08/02
CHROMIUM, TCLP LEACH	MB3	W	02L0241	N/A	05/08/02	05/08/02
MERCURY LABORATORY	LC1 BS	W	02C0120	N/A	05/02/02	05/03/02
MERCURY, TOTAL	MB1	W	02C0120	N/A	05/02/02	05/03/02
MERCURY, TCLP LEACHA	MB2	W	02C0120	N/A	05/02/02	05/03/02
MERCURY, TCLP LEACHA	MB3	W	02C0120	N/A	05/02/02	05/03/02
LEAD LABORATORY	LC1 BS	W	02L0241	N/A	05/08/02	05/08/02
LEAD, TCLP LEACHATE	MB1	W	02L0241	N/A	05/08/02	05/08/02
LEAD, TCLP LEACHATE	MB2	W	02L0241	N/A	05/08/02	05/08/02
LEAD, TCLP LEACHATE	MB3	W	02L0241	N/A	05/08/02	05/08/02
SELENIUM LABORATORY	LC1 BS	W	02L0241	N/A	05/08/02	05/08/02
SELENIUM, TCLP LEACH	MB1	W	02L0241	N/A	05/08/02	05/08/02
SELENIUM, TCLP LEACH	MB2	W	02L0241	N/A	05/08/02	05/08/02
SELENIUM, TCLP LEACH	MB3	W	02L0241	N/A	05/08/02	05/08/02



Analytical Report

Client: TNU-HANFORD B02-050

W.O.#: 11343-606-001-9999-00

LVL#: 0204L529

Date Received: 04-30-02

SDG/SAF#: H1760/B02-050

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample and 1 TCLP leachate sample.

- The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All ICP TCLP samples were reported with a six fold dilution due to sample matrix.
- 3. All analyses were performed within the required holding times.
- 4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

		<u>PDS</u>	<u>PDS</u>
Sample ID	Element	Concentration (ppb)	% Recovery
B14DJ8	Manganese	2000	110.2

- 12. For the soil sample, the duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. For the TCLP sample, the duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
- 13. The TCLP extract from sample B14DJ8 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.
- 14. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
- 15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated



METALS METHOD GLOSSARY

	The following	methods are used as refe	erence for the digestic	nn and analysis	of samples	contained within this		
CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0	Lot#: 02041529							
CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0		. /	1312 Other:					
Metals Digestion Methods:3005A								
Metals Analysis Methods	CLP Metals	Digestion and Analysi	is Methods: ILM(/	13.0ILM04	.0			
Netals Analysis Methods	Metals Digestio		3010A _3015 _30	020A <u>/</u> 3050B	_3051	200.7SS17		
SW846 EPA STD MTD OSWR USATHAMA	•							
Aluminum Antimony Antimony 6010B 7041 200.7 204.2 Arsenic 6010B 7060A 200.7 206.2 3113B 99 Arsenic 6010B 7060A 200.7 206.2 3113B 99 Barium 6010B 200.7 99 Beryllium 6010B 200.7 99 Boron 6010B 7131A 200.7 213.2 99 Cadmium 6010B 7191 200.7 213.2 99 Chromium 6010B 200.7 99 Chromium 6010B 200.7 99 Chromium 6010B 7191 200.7 213.2 99 Chromium 6010B 7191 200.7 213.2 99 Chromium 6010B 7191 200.7 213.2 99 Chromium 6010B 200.7 99 Lead 6010B 7421 200.7 220.2 99 Iron 6010B 7421 200.7 220.2 99 Lithium 6010B 7430 200.7 99 Lead 6010B 7430 200.7 99 Lithium 6010B 7430 200.7 99 Manganese 6010B 200.7 99 Manganese 6010B 200.7 99 Mercury 7470A 7471A 245.1 245.5 99 Mercury 7470A 7471A 245.1 245.5 99 Nickel 6010B 7610 200.7 99 Nickel 6010B 7610 200.7 99 Nickel 6010B 7610 200.7 99 Selenium 6010B 7610 200.7 1620 99 Selenium 6010B 7610 200.7 1620 99 Silicon 6010B 770 200.7 270.2 3113B 99 Silicon 6010B 770 99 Silicon 6010B 770 99 Silicon 6010B 770 99 Silicon 6010B 770 99 Silicon 6010B 770 99 Silicon 6010B 770 99 Silicon 6010B 770 99 Silicon 9010B 9010B 9010B 9010B 9010B 9010B 9010B 9010B 9010B 9010B 9010B 9010B 9010B 901		N	Aetals Analysis Mo	ethods				
Aluminum		011046	F.D.	COMP. A COMP.				
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Thallium _6010B _7841 ' _200.7 _ 279.2 _ 200.9 _99 Tin _6010B _200.7 _99 Titanium _6010B _200.7 _99 Uranium _6010B ' _200.7 ' _162099 Vanadium _6010B200.7 ' _99 Zinc _6010B200.7 ' _99	Sodium							
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Titanium 6010B 200.7 99 Uranium 6010B 200.7 1620 99 Vanadium 6010B 200.7 99 Zinc 6010B 200.7 99	Thallium	_6010B7841 ⁵	200.7279.22	00.9				
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Uranium 6010B' 200.7' 1620 99 Vanadium 6010B 200.7 99 Zinc 6010B 200.7 99	Titanium	6010B	200.7					
Vanadium 6010B 200.7 99 Zinc 6010B 200.7 99	Uranium	6010B ¹	200.7 '		1620			
	Vanadium		200.7					
Zirconium 6010B 200.7 1 1620 99	Zinc		200.7			99		
	Zirconium	6010B '	200.7 '		1620	99		

L-W1-033/M-03/01

Method:

Other:

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

- E = The reported value is estimated because of the presence of interference.
- M = Duplicate injection precision not met.
- N = Spiked sample recovery not within control limits.
- S = The reported value was determined by the Method of Standard Additions (MSA).
- W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.
- * = Duplicate analysis not within control limits.
- += Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.

S = Matrix Spike.

T = Matrix Spike Duplicate.

R or D = Sample Replicate

ANALYTICAL METAL METHODS

- 1. Not included in the method element list.
- 2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
- 3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
- 4. Flame AA.
- Graphite Furnace AA.
 RFW 21-21L-033/O-01/97

INORGANICS DATA SUMMARY REPORT 05/21/02

CLIENT: TNUHANFORD B02-050 H1760 LVL LOT #: 0204L529

			reporting	DILUTION
SAMPLE SITE ID ANALYTE	RESULT	UNITS	LIMIT	FACTOR
医医学医学学 化电子放射性 医医电子性 医电子性 医电子性 医电子性 医电子性 医电子性 医电子性 医电	经通常性的 埃尔耳希斯斯斯德	*****	*******	****
-001 B14DJ8 Silver, Total	0.05 u	MG/KG	0.05	1.0
Arsenic, Total	3.7	MG/KG	0.27	1.0
Boron, Total	1.3	MG/KG	0.15	1.0
Barium, Total	78.1	MG/KG	0.01	1.0
Beryllium, Total	0.22	MG/KG	0.01	1.0
Cadmium, Total	0.05	NG/KG	0.03	1.0
Chromium, Total	8.9	MG/KG	0.05	1.0
Copper, Total	13.5	MG/KG	0.03	1.0
Mercury, Total	0.02 u	MG/KG	0.02	1.0
Magnesium, Total	4200	MG/KG	0.60	1.0
Manganese, Total	348	MG/KG	0.01	1.0
Molybdenum, Total	0.63	MG/KG	0.12	1.0
Nickel, Total	9.9	MG/KG	0.1	1.0
Lead, Total	7.1	MG/KG	0.18	1.0
Selenium, Total	0.38 u	MG/KG	0.38	1.0
Vanadium, Total	56.6	MG/KG	0.08	1.0
Zinc, Total	45.0	MG/KG	0.04	1.0

INORGANICS DATA SUMMARY REPORT 05/21/02

CLIENT: TNUHANPORD B02-050 H1760 LVL LOT #: 0204L529

ORTING DILUTI T FACTOR	:
3.0 6	.0
15.0 6	. 0
0.60 6	. 0
1.8 6	. 0
3.0 6	. 0
0.10 1	.0
10.2 6	. 0
21.0 6	. 0
	15.0 6 0.60 6 1.8 6 3.0 6 0.10 1 10.2 6

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/21/02

CLIENT: TNUHANFORD B02-050 H1760 LVL LOT #: 0204L529

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RBSULT	UNITS	LIMIT	FACTOR
******	*************	**********	*****			******
BLANK1	02L0248-MB1	Silver, Total	0.05 u	MG/KG	0.05	1.0
		Arsenic, Total	0.25 u	NG/KG	0.25	1.0
		Boron, Total	0.14 u	MG/KG	0.14	1.0
		Barium, Total	0.11	MG/KG	0.01	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.06	MG/KG	0.05	1.0
		Copper, Total	0.03 u	MG/KG	0.03	1.0
		Magnesium, Total	1.6	MG/KG	0.56	1.0
		Manganese, Total	0.02	MG/KG	0.01	1.0
		Molybdenum, Total	0.11 u	MG/KG	0.11	1.0
		Nickel, Total	0.09 u	MG/KG	0.09	1.0
		Lead, Total	0.25	MG/KG	0.17	1.0
		Selenium, Total	0.35 u	NG/KG	0.35	1.0
		Vanadium, Total	0.07 u	MG/KG	0.07	1.0
		Zinc, Total	0.10	MG/KG	0.04	1.0
BLANK1	02C0123-MB1	Mercury, Total	0.02 u	mg/kg	0.02	1.0
BLANK1	02L0241-MB1	Silver, TCLP Leachate	0.50 u	UG/L	0.50	1.0
		Arsenic, TCLP Leachate	2.5 u	UG/L	2.5	1.0
		Barium, TCLP Leachate	0.25	ng\r	0.10	1.0
		Cadmium, TCLP Leachate	0.30 u	UG/L	0.30	1.0
		Chromium, TCLP Leachate	0.50 u	UG/L	0.50	1.0
		Lead, TCLP Leachate	1.7 u	UG/L	1.7	1.0
		Selenium, TCLP Leachate	3.5 u	UG/L	3.5	1.0
BLANK2	02L0241-MB2	Silver, TCLP Leachate	3.0 u	UG/L	3.0	6.0
		Arsenic, TCLP Leachate	15.0 u	UG/L	15.0	6.0
		Barium, TCLP Leachate	2.6	UG/L	0.60	€.0
		Cadmium, TCLP Leachate	1.8 u	UG/L	1.8	6.0
		Chromium, TCLP Leachate	3.0 u	UG/L	3.0	6.0
		Lead, TCLP Leachate	10.2 u	UG/L	10.2	6.0
		Selenium, TCLP Leachate	21.0 u	UG/L	21.0	6.0
BLANK3	02L0241-MB3	Silver, TCLP Leachate	3.0 u	UG/L	3.0	6.0
		Arsenic, TCLP Leachate	15.0 u	UG/L	15.0	6.0
		Barium, TCLP Leachate	4.1	UG/L	0.60	6.0
		Cadmium, TCLP Leachate	1.8 u	UG/L	1.8	6.0
		Chromium, TCLP Leachate	3.0 u	UG/L	3.0	6.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/21/02

CLIENT: TNUHANPORD B02-050 H1760 LVL LOT #: 0204L529

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
******	**************	*********************		*****	******	
BLANK3	02L0241-MB3	Lead, TCLP Leachate	10.2 u	UG/L	10.2	6.0
		Selenium, TCLP Leachate	21.0 u	UG/L	21.0	6.0
BLANK1	02C0120-MB1	Mercury, Total	0.10 u	UG/L	0.10	1.0
BLANK2	02C0120-MB2	Mercury, TCLP Leachate	0.10 u	UG/L	0.10	1.0
BLANK3	02C0120-MB3	Mercury, TCLP Leachate	0.10 u	UG/L	0.10	1.0

INORGANICS ACCURACY REPORT 05/21/02

CLIENT: TNUHANFORD 802-050 H1760 LVL LOT #: 0204L529

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	Sample	RESULT	AMOUNT	*RECOV	FACTOR (SPK)
=======	**************	***********	======		*=====	******	=======================================
-001	B14DJ8	Silver, Total	4.8	0.05u	5.4	88.9	1.0
		Arsenic, Total	191	3.7	216	87.0	1.0
		Boron, Total	91.3	1.3	108	83.5	1.0
		Barium, Total	264	78.1	216	86.5	1.0
		Beryllium, Total	4.9	0.22	5.4	86.7	1.0
		Cadmium, Total	4.8	0.05	5.4	88.0	1.0
		Chromium, Total	27.8	8.9	21.6	87.5	1.0
		Copper, Total	37.9	13.5	26.9	90.7	1.0
		Mercury, Total	0.16	0.02u	0.17	7 90.2	1.0
		Magnesium, Total	6540	4200	2700	87.0	1.0
		Manganese, Total	374	348	53.9	48.4*	1.0
		Molybdenum, Total	95.7	0.63	108	88.2	1.0
		Nickel, Total	56.5	9.9	53.9	86.5	1.0
		Lead, Total	54.7	7.1	53.9	88.3	1.0
		Selenium, Total	180	0.38u	216	83.5	1.0
		Vanadium, Total	99.7	56.6	53.9	80.0	1.0
		Zinc, Total	88.4	45.0	53.9	80.5	1.0

INORGANICS ACCURACY REPORT 05/21/02

CLIENT: TNUHANFORD B02-050 H1760 LVL LOT #: 0204L529

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	AMOUNT	*RECOV	FACTOR (SPK)
	***********	*************			*****		
-002	B14DJ8	Silver, TCLP Leachate	2800	3.0 u	5000	56.0	6.0
		Arsenic, TCLP Leachate	4920	18.5	5000	98.1	6.0
		Barium, TCLP Leachate	90500	394	100000	90.1	6.0
		Cadmium, TCLP Leachate	1000	1.8 u	1000	100.1	6.0
		Chromium, TCLP Leachat	4870	3.0 u	5000	97.5	6.0
		Mercury, TCLP Leachate	187	0.10u	200	93.4	50.0
		Lead, TCLP Leachate	5000	10.2 u	5000	100.0	6.0
		Salanium TCLD Leachat	976	21 0 11	1000	97 6	6.0

INORGANICS PRECISION REPORT 05/21/02

CLIENT: TNUHANFORD B02-050 H1760 LVL LOT #: 0204L529

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	PACTOR (REP)
		PRESENTATE	*****	*******		********
-001RBP	B14DJ8	Silver, Total	0.05u	0.05u	NC	1.0
		Arsenic, Total	3.7	3.4	8.5	1.0
		Boron, Total	1.3	1.0	26.1	1.0
		Barium, Total	78.1	75.7	3.1	1.0
		Beryllium, Total	0.22	0.18	18.3	1.0
		Cadmium, Total	0.05	0.09	54.0	1.0
		Chromium, Total	8.9	7.6	15.8	1.0
		Copper, Total	13.5	12.4	8.5	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Magnesium, Total	4200	3840	9.0	1.0
		Manganese, Total	348	333	4.4	1.0
		Molybdenum, Total	0.63	0.67	6.2	1.0
		Nickel, Total	9.9	8.9	10.6	1.0
		Lead, Total	7.1	6.5	8.8	1.0
		Selenium, Total	0.38u	Q.38u	NC	1.0
		Vanadium, Total	56.6	50.6	11.2	1.0
		Zinc, Total	45.0	59.1	27.1	1.0

INORGANICS PRECISION REPORT 05/21/02

CLIENT: TNUHANFORD B02-050 H1760 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0204L529

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	PACTOR (REP)
	***********	****************		=======		E25555555
-002REP	B14DJ8	Silver, TCLP Leachate	3.0 u	3.4	005 9N	6.0
		Areenic, TCLP Leachate	18.5	15.0 u	NC 500	6.0
		Barium, TCLP Leachate	394	394	0.051	6.0
		Cadmium, TCLP Leachate	1.8 u	1.8 u	NC	6.0
		Chromium, TCLP Leachate	3.0 u	5.8	GOS pin	6.0
	•	Mercury, TCLP Leachate	0.10u	0.10u	NC	1.0
		Lead, TCLP Leachate	10.2 u	10.2 u	NC	6.0
		Selenium, TCLP Leachate	21.0 u	21.0 u	NC	6.0

ym 5/21/02

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/21/02

CLIENT: TNUHANFORD 802-050 H1760 LVL LOT #: 0204L529

			SPIKED	SPIKED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	AMOUNT	UNITS	*RBCOV
======						
LCS1	02L0248-LC1	Silver, LCS	48.0	50.0	MG/KG	96.0
		Arsenic, LCS	911	1000	MG/KG	91.1
		Boron, LCS	464	500	MG/KG	92.7
		Barium, LCS	476	500	MG/KG	95.1
		Beryllium, LCS	24.7	25.0	MG/KG	98.8
		Cadmium, LCS	23.9	25.0	MG/KG	95.6
		Chromium, LCS	49.2	50.0	MG/KG	98.4
		Copper, LCS	123	125	MG/KG	98.2
		Magnesium, LCS	2350	2500	MG/KG	94.0
		Manganese, LCS	74.6	75.0	MG/KG	99.5
		Molybdenum, LCS	486	500	MG/KG	97.1
		Nickel, LCS	193	200	MG/KG	96.4
		Lead, LCS	239	250	MG/KG	95.5
		Selenium, LCS	866	1000	MG/KG	86.6
		Vanadium, LCS	245	250	MG/KG	98.1
		Zinc, LCS	94.6	100	MG/KG	94.6
LCS1	02C0123-LC1	Mercury, LCS	2.4	2.5	MG/KG	96.6
LCS1	02L0241-LC1	Silver, LCS	486	500	UG/L	97.1
		Arsenic, LCS	9450	10000	UG/L	94.5
		Barium, LCS	4650	5000	UG/L	92.9
		Cadmium, LCS	252	250	UG/L	100.6
		Chromium, LCS	504	500	UG/L	100.9
		Lead, LCS	2490	2500	UG/L	99.6
		Selenium, LCS	9270	10000	UG/L	92.7
LCS1	02C0120-LC1	Mercury, LCS	5.2	5.0	UG/L	103.3

0204L			Custo	dy Tra								Re	qu	es	l Pa	ige	of			Ü		V	L	1
						· · · · · · ·		J.,		A	B	c .	D	E	F	G	H		I.	عر ا	< <u>"</u>	144111 IV	ter waters	, , , ,
Client HA	dfo	LD.	Bo 2-0	50.			Refriger	ntor#		1	5	5	5	5	5	5	5		5	5	5	5		
Est. Final Proj Project #	Semp	ling Date			3.Q	2	#/Type (Container	38		ilija 1000		ill.	,4 c 4	746	e Ke	HC.				GG.		7	
Project Conta	:t/Phon			೦೨			Volume	ı	Latino.	<i>35</i> 0			1	AM.			95J			7	(4) (5)	7,57%	.	
ac_5/to		Del 510		30	dout		Preserv	ratives						X (***)							ر ا	30 Te 3	#e	
Date Rec'd	4 -3	0-02	Date Due _	5-30	·		ANALY: REQUE		-	VOA		ANIC B B B B CB	Herb	E _{ST}	15 P	100	Metal N	RG S	URU GKO	IL AV,	Tell Met	Markey	600	
MATRIX					Щ	trix						<u> </u>	1		Llonv				e Only		<u>↓</u>	100 16.2	4 15 1	
CODES: S - Soil SE - Sediment SO - Solid SL - Studge	Lab ID	, (Client ID/Descri	ption	Ch (MSD	Matrix	Date Collected	Time Collected	X4790	0625×	0608	OHBGN	74000	OGCSC	ECR 6	METO		02/40	INDREC	TTCLP	2 HYZN	RCRATCH	
later sadio	001	B142	278		1	7	S	4-23-07	1240		1	10	1	1	1	1	7	沙湾	1	1	4	100	(74)	100
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Solids									2 10 Y	23	100 E			6		T.A		1.77 (c) 1.47 (c)			F-		\$ 5 4.5	
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X Other F Fish											4				7/1				100		8.	a and a same		
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								-×	Su	Lal	ch	non			# . Yi			1. A.	(A)	4.20	enderse ender en	4. C.	1.00	
Special Instruc	tions:	SAF #	B02-	050			REVISIO		RA +	Be,	B.C	u, Ma	3. M	<u>n. M</u>	o, Ni	V,Z	n s	amples		ille Lab		y Use C	Only esistant Se	eel was:
					•			2. ICFL 3. Alca						LNJA	12, I	FD_	- H	Shipp land De	ed	_ or	P	ackage	ng Oi or	r N
						<u> </u>	<u> </u>	3. <u>/T(CA</u>	MO(), G	17 00	<u></u>	TCL ION					- 4	Zee	ent or 6	hilleg	P	ackage	kerron or or nyton, Sa	N
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Relinquishe	-	Received	Date	Time	Relinqu	lshed	T	6	- 1	Date	T	me	Disc	Teneno	ies Bel	hween) Samp roperly	Preser	ved or N	S	ample(OC Re	y or cord Pre	N esent
THE ED	7-	Nesno S	7 4-3002		C(OMPC WAS		by	ORIG REWI	N/	VL.		Sen CO NO	nples L C Reco TES:	abela a rd? Y	or (1)	′ ⊦	lolding	ived Wil	thin:	c	pon Sa cooler emp	/-5	lect X N _°C

02046 529

Bechtel Hanfo	rd Inc.	C	HAIN OF CUST	ODY/S	SAMPL	E ANAL	YSIS	REQUES	$\overline{\mathbf{r}}$	B02	2-050-01	Page 1	of 2
Collector R. Fahlberg/R. Nielson		Comp	nny Contact ne Jacques	Telepho 372-9	me No.			Project Coord TRENT, SJ	Instar	Price Code	8N	Data Tur	
Project Designation 216-Z-11 Ditch Borehole San	nples		ing Location West					SAF No. B02-050		Air Quality	, <u> </u>	45]	Days
Ice Chest No.	00-50	Fleid I	Logbook No. 1517-		COA B20CW5	674C		Method of Shi Federal Exp					
Shipped to TMARECRA			Property No. AC	bz r	US	8		Bill of Lading	Air BM N	05	PC		
Radioactive Poten	tial		Preservation	Cool 4C	Cool 4C	Cool 4C	Cool	ļ	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Tie Special Handling and/or	TO BI4D	117	Type of Container	∎G	ĕ <i>G</i>	aG	P	aG	G	*G	aG	aG	aG.
	oL		No. of Container(s)	1 120mL	1 250mL	1 120mL	1000		250mL	1 120mL	250mL	1	1 250mL
			Volume	See item (1) i			See item		PCBs - 808		230mL Herbicides -	250mL See item (4) in	Alcohola
	Sample ana	Lysis		Special instructions	Special	Hex - 7196	Spec	ini D1385	I CDs - one	8081	8150A	Special Instructions.	Glycols, & Ketones - 8015 (Methanol)
Sample No.	Matrix *	Sample Date	Sample Time										
B14DJ8	SOIL	4-23-0	2 1240	X	X	χ	لا		Х	_X	X	Х	X
				 			ļ		 			<u> </u>	
CHAIN OF POSSESSI	ON	Sign/Prin	t Names	<u> </u>	 Gm	ECIAL INSTR	I CTI	ONE	<u> </u>		<u> </u>	<u> </u>	Matrix *
Retinguished By/Removed From RF-800 Professor	Date/Time (X	5 Received Byleto	M 4.2302	te/Time 1615 te/Time C	Sec (1) (1) (1) (2)	Metals by ICP (preury (TCLP) - 1 ICP Metals - 60	on SAF TCLP) - 311/7470 10A (Sup	1311/6010 {Arseni) pertrace) {Arsenic, l	Barium, Cada	ium, Chromium,	Lead, Scienius	n, Silver);	g-Gell SIS-Sediment SO-Solid SI-Sledge W = Water
Religional By/Rempula Plan		Raceigned By/Sto	ngd In D	ste/Time	(4) (5) (4)	olybdenum, Nicke IC Anions - 300	il, Vanadi .0 (Phuor ICL); V(ace Add-On) (Bery itum, Zinc); Mercur ide, Nitrate, Sulfate OA - 8260A (Add-On)	y - 7470 - (C' }; Ammonia	V) - 350.3; NO2/NO)3 - 353.1; Salfi	des - 9030	O-OR A-Air D3-Drum Solide DL-Drum Liquids TuTismas WiwWipe
Relinquished By/Removed Fram	Date/Time	Received By/8to	red in D	o⊥ j∝ ste/Time		Personne relinquis	not a	valiable to Finds of the 37.	15				1Elepid V-Veptation X-Other
Relinquished By/Removed From	Date/Time	Received By/Sto	red in D	ate/Time		Kef#	△——		<i>ت</i> 				
LABORATORY Received I	By			1	Title						1	Date/Time	
FINAL SAMPLE Disposal P	Viethod					Disp	osed By					Date/Time	

Bechtel Hanfor	d Inc.	CI	IAIN OF CUST	ODY/S	AMPLE	AN	ALY	SIS	RI	QUEST		B02	2-050-01	Page 2	of 2
Collector R. Fahlberg/R. Nielson			ny Contact ne Jacques	Telephor 372-9		_				ject Coordina NT, SJ	P	rice Code	8N	Data Turr	1
Project Designation 216-Z-11 Ditch Borehole Sam	ples		ng Location West						3	? No. -050	Ai	ir Quality		45 I	ays
Ice Chest No. ERC	32-008	Field I EL-	ogbook No. 1517-		COA Method of Shipment B20CW5674C Federal Express					1					
Shipped To TMARECRA		Offsite	Property No. A	bz0	088	7			Bū	of Lading/A	rви Se	eo	SPC		
Possib le sa mple hazai						1	24.0	- 1	-1	2					
Radioactive Potenti			Preservation	Cool 4C	Cool 4C	प्र		No	ne L	4.02		}	})]	
TIETO Special Handling and/or	B14Dレ Storage	7	Type of Container	aG	вG			aC							
1			No. of Container(s)	1	1	U	•	1		1 1		l			
COO	ļ		Volume	250m£	120mL	1 1	Orni	11:01	mL						
			<u></u>	RUN 4-16			14-4L-			4/16/02		 			
	SAMPLE ANAL	.YSIS		See item (1) in Special 5 Instructions	Range -		enial 6 ections.	See item Sou Institut							
Sample No.	Matrix *	Sample Date	Sample Time												
B14DJ8	SOIL	4-23-0	2 1240	Χ	Χ	_>	₹	<u></u>							
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					+	十		一					 	 	
CHAIN OF POSSESSIO	NON .	Sign/Prin	it Names		SPE	CIAL 1	NSTR	UCTI	ONS	J		<u> </u>	<u> </u>	<u> </u>	Matrix *
Relinquished By/Removed From	Date/Time (61	Received By/Rio		ate/Time	See	COC cor	nments								S~doil
Been Be	h then 4.23.0	32 18.T I			12 505	Semi-V(OA - 82			mi-VOA ~ 8270					SI)=Gediment SO=Solid
Resinquished By/Removed From	778 4.797	3 Total VSI	[win K Norg	op/Tipe	200	atyt pno: Janana	spnac; Spec_C	o mplet e	Ces	fimony ~ 25 jim-134 Cosim	-137, Cobel	t 60, Baroptum	-152, Europium	FISH	S1=Studge W = Water
Reinforished By Removed Flore	CADMe/Time OB	Reserved By/Sio	reditor O	me yane 4	290 No.	distant i	1374 Ma	kel 63-	Stront		al Gr. Toolow	Aiant-99, Trick	us - ID, isotopi	e Limniya	O=OH A~Afr
N. J.	K (- + 26)	Z154	1200	X.		l sotopia I -on) (E			ericiur	n-241/Curium-1	I4 (Americ ia	241); Amer		uca-24/	DS-Drein Solids DC-Drein Liquids T-Tissue
Religioushed By/Removed From	Dete/Time 30-02 [005	Received Butsto		rate/Time -ウン / クロ	-	, (5				_	~ .		E.	1.24.0Z	
Relinquished By/Removed From	Date/Time	Received By/Sto		ate/Time			Perso: relina	nnei no nish.sa	ot av:	ilable to	4	_	,		V=Vegetation X=Other
Relinquished By/Removed From	Date/Time	Received By/Sto	red in D	ete/Time			Ref#	14	On_	s from the 3	2				j
LABORATORY Received E	у				itle		<u> </u>		•	-			1	Date/Time	
FINAL SAMPLE Disposal A DISPOSITION	fethod						Dispo	sed By				· · · · · · · · · · · · · · · · · · ·	<u></u>	Date/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD
Purchase Order/Project:

DATE: 4.30.02

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG #: 02041529

OTE:	ALL ENTRIES MARKED "NO" MUST BE	EXPLAINED I	N THE COMM	IENT SECTION	Y
1.	Custody seals on coolers or shipping container intact, signed and dated?	□/Yes	□ No	O N/A	see Comment #
2.	Outside of coolers or shipping containers are free from damage?	© Yes	□ No	D N/A	☐ see Comment #
3.	Airbill # recorded?	D Yes	□ No	□ N/A	🗆 see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic	D Yes	· 🛭 No	□ N/A	□ see Comment #
	bag and taped to inside lid)				
5.	Sample containers are intact?	□ Yes	□ No	□ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	□.x/es	□ No	□ N/A	see Comment #
7.	All samples on coc received?	© Xes	□ No	□ N/A	see Comment #
8.	All sample label information matches coc?	ם אני	□ No	□ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	E Yes	□ No	□ N/A	see Comment #
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	UZ Yes	□ No	□ N/A	see Comment #
	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	D)MA	🗅 see Comment #
12.	coc signed and dated?	√Z Yes	□ No	□ N/A	see Comment #
13.	coc faxed or emailed to client?	□ Yes	□ No	□ N/A	□ see Comment #
	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	D N/A	☐ see Comment #

Cooler # / temp and Comments:

2-008

1.5

Laboratory Sample Custodian:

Laboratory Project Manager:

Vield Hervedy



Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1760

DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID /ANALYSIS		#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14DJ8							
% SOLIDS	001		s	02L%S046	04/23/02	05/03/02	05/05/02
% SOLIDS	001	REP	S	02L%S046	04/23/02	05/03/02	05/05/02
FLUORIDE BY IC	001		S	02LIC036	04/23/02	05/24/02	05/24/02
FLUORIDE BY IC	001	REP	S	02LIC036	04/23/02	05/24/02	05/24/02
FLUORIDE BY IC	001	MS	S	02LIC036	04/23/02	05/24/02	05/24/02
NITRATE BY IC	001		S	02LIC036	04/23/02	05/24/02	05/24/02
NITRATE BY IC	001	REP	S	02LIC036	04/23/02	05/24/02	05/24/02
NITRATE BY IC	001	MS	S	02LIC036	04/23/02	05/24/02	05/24/02
CHROMIUM VI	001		S	02LVI013	04/23/02	05/03/02	05/03/02
CHROMIUM VI	001	REP	S	02LVI013	04/23/02	05/03/02	05/03/02
CHROMIUM VI	001	MS	S	02LVI013	04/23/02	05/03/02	05/03/02
CHROMIUM VI	001	MSD	S	02LVI013	04/23/02	05/03/02	05/03/02
SULFATE BY IC	001		S	02LIC036	04/23/02	05/24/02	05/24/02
SULFATE BY IC	001		S	02LIC036	04/23/02	05/24/02	05/24/02
SULFATE BY IC	001	MS	S	02LIC036	04/23/02	05/24/02	05/24/02
HYDRAZINE	001		s	02LHZ006	04/23/02	05/03/02	05/03/02
HYDRAZINE	001		S	02LHZ006	04/23/02	05/03/02	05/03/02
HYDRAZINE	001	MS	S	02LHZ006	04/23/02	05/03/02	05/03/02
NITRATE NITRITE	001		S	02LN3D28	04/23/02	05/21/02	05/21/02
NITRATE NITRITE	001		S	02LN3D28	04/23/02	05/21/02	05/21/02
NITRATE NITRITE	001	MS	S	02LN3D28	04/23/02	05/21/02	05/21/02
AMMONIA	001		S	02LAMA09	04/23/02	05/21/02	05/21/02
AMMONIA	001	REP	S	02LAMA09	04/23/02	05/21/02	05/21/02
AMMONIA	001	MS	S	02LAMA09	04/23/02	05/21/02	05/21/02
SULFIDE	001		s	02LSD015	04/23/02	05/05/02	05/05/02
SULFIDE	001		S	02LSD015	04/23/02	05/05/02	05/05/02
SULFIDE	001	MS	S	02LSD015	04/23/02	05/05/02	05/05/02
TCLP	001		S	02LTO210	04/23/02	05/01/02	05/02/02
D. 00							
AB QC:							
FLUORIDE BY IC	MB1		s	02LIC036	N/A	05/24/02	05/24/02
FLUORIDE BY IC	MB1	BS	s	02LIC036	N/A	05/24/02	05/24/02
NITRATE BY IC	MB1		Š	02LIC036	N/A	05/24/02	05/24/02
NITRATE BY IC	MBl	BS	Š	02LIC036	N/A	05/24/02	05/24/02

Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1760

DATE RECEIVED: 04/30/02 LVL LOT # :0204L529

CLIENT ID /ANALYSIS	LVL #	МТХ	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
The state of the s	*******					************
CHROMIUM VI	MB1	S	02LVI013	N/A	05/03/02	05/03/02
CHROMIUM VI	MB1 BS	S	02LVI013	N/A	05/03/02	05/03/02
CHROMIUM VI	MB1 BSD	S	02LVI013	N/A	05/03/02	05/03/02
SULFATE BY IC	MB1	S	02LIC036	N/A	05/24/02	05/24/02
SULFATE BY IC	MB1 BS	S	02LIC036	N/A	05/24/02	05/24/02
HYDRAZINE	MB1	S	02LHZ006	N/A	05/03/02	05/03/02
HYDRAZINE	MB1 BS	S	02LHZ006	N/A	05/03/02	05/03/02
NITRATE NITRITE	MB1	S	02LN3D28	N/A	05/21/02	05/21/02
NITRATE NITRITE	MB1 BS	S	02LN3D28	N/A	05/21/02	05/21/02
AMMONIA	MB1	S	02LAMA09	N/A	05/21/02	05/21/02
AMMONIA	MB1 BS	S	02LAMA09	N/A	05/21/02	05/21/02
AMMONIA	MB1 BSD	S	02LAMA09	N/A	05/21/02	05/21/02
SULFIDE	MB1	S	02LSD015	N/A	05/05/02	05/05/02
SULFIDE	MB1 BS	S	02LSD015	N/A	05/05/02	05/05/02



Analytical Report

Client: TNU-HANFORD B02-050 H1760

W.O.#: 11343-606-001-9999-00

LVL#: 0204L529

Date Received: 04-30-02

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

- 2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met with the exception of Hydrazine and Sulfide.
- 4. All results presented in this report are derived form samples that met LvLI's sample acceptance policy.
- 5. The method blanks were within the method criteria.
- The Laboratory Control Samples (LCS) were within the laboratory control limits. The 6. duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.
- 7. The matrix spike recoveries were within the 75-125% control limits.
- 8. The replicate analyses were within the 20% RPD control limit.
- 9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

njp\i04-529

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	<u>SW846</u>	OTHER
% Ash	D2216-80		
% Moisture	D2216-80		ILMO4.0 (e)
% Solids	D2216-80		ILMO4.0 (e)
% Volatile Solids	D2216-80		
ASTM Extraction in Water	D3987-81/85		
BTU	D240-87		
CEC		9081	c
Chromium VI		₹3060A/7196A	_
Corrosivity by coupon by pH		1110(mod)9045C	
Cyanide, Total		9010B	ILMO4.0 (e)
Cyanide, Reactive		Section 7.3/9014	
Halides, Extractable Organic		9020B	EPA 600/4/84-008
Halides, Total		9020B	EPA 600/4/84-008
EP Toxicity		1310A	_
Flash Point		1010	
Ignitability		1010	
Oil & Grease		9071A	
Carbon, Total Organic		9060	Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	D240-87(mod)	5050	
Petroleum Hydrocarbons, Total Red	coverable	9071	EPA 418.1
pH, Soil		9045C	
Sulfide, Reactive		Section 7.3/9030B	
Sulfide		✓ 9030B(mod)	
Specific Gravity	D1429-76C/ _	D5057-90	
Sulfur, Total		9056	
Synthetic Preparation Leach		1312	
Paint Filter		9095A	
Other: Jenoual Hitrate the	state Method: E	PA 3000 (mod.)	
Other: Thydraging	V Method U	SAFSAM Report	TR-82-29
Atrate Athite	6	PA 353 2 (mod.) PA 350.3 (mod.)	
anmonia	EI	PA 350.3 (mod.)	

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

- 1. ASTM Standard Methods.
- USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
- a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
- b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
- c. <u>Method of Soil Analysis</u>, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
- d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

INORGANICS DATA SUMMARY REPORT 05/31/02

CLIENT: TNUHANPORD B02-050 H1760 LVL LOT #: 0204L529

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
	*************	****	=======		*********	
-001	B14DJ8	* Solids	92.B	4	0.01	1.0
		Fluoride by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	24.2	MG/KG	1.35	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	4.2	MG/KG	1.3	1.0
		Hydrazine	1.0 u	MG/KG	1.0	1.0
		Nitrate Nitrite	5.3	MG/KG	0.22	1.0
		Ammonia, as N	2.9 u	MG/KG	2.9	1.0
		Sulfide	20.8 u	MG/KG	20.8	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/31/02

CLIENT: TNUHANFORD B02-050 H1760 LVL LOT #: 0204L529

WORK ORDE	5K: 11343-000-001-3333-				REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
	***********	****	******	*****	*****	
BLANK10	02LIC036-MB1	Fluoride by IC	1.2 u	MG/KG	1.2	1.0
		Nitrate by IC	1.25 u	NG/KG	1.25	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK10	02FA1073-WB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	02LHZ006-MB1	Hydrazine	1.0 u	MG/KG	1.0	1.0
BLANK10	02LN3D28-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	02LAMA09-MB1	Ammonia, as N	2.5 u	MG/KG	2.5	1.0
BLANK10	02LSD015-MB1	Sulfide	20.0 u	MG/KG	20.0	1.0

INORGANICS ACCURACY REPORT 05/31/02

CLIENT: TNUHANFORD B02-050 H1760 LVL LOT #: 0204L529

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	AMOUNT	*RECOV	Pactor (SPK)
******	=======================================	******		****	*****	*****	
-001	B14DJ8	Fluoride by IC	31.2	0.59	27.0	113.4	1.0
		Nitrate by IC	82.1	24.2	54.0	107.2	2.0
		Soluble Chromium VI	4.4	0.43u	4.3	96.9	1.0
		Insoluble Chromium VI	1120	0.43u	1180	95.3	100
		Sulfate by IC	33.2	4.2	27.0	107.4	1.0
		Hydrazine	5.1	1.0 u	5.4	94.3	1.0
		Nitrate Nitrite	9.4	5.3	4.4	94.8	2.0
		Ammonia, as N	105	2.9 u	112	93.5	1.0
		Sulfide	242	8.7	250	93.3	1.0
BLANK10	02LIC036-MB1	Fluoride by IC	25.4	1.2 u	25.0	101.8	1.0
		Nitrate by IC	24.0	1.25u	25.0	95.9	1.0
		Sulfate by IC	24.4	1.2 u	25.0	97.6	1.0
BLANK10	02LVI013-MB1	Soluble Chromium VI	3.9	0.40u	4.0	98.7	1.0
		Insoluble Chromium VI	1150	0.40u	1160	98.8	100
BLANK10	02LHZ006-MB1	Hydrazine	5.0	1.0 u	5.0	100.7	1.0
BLANK10	02LN3D28-MB1	Nitrate Nitrite	5.3	0.20u	5.0	105.4	1.0
BLANK10	02LAMA09-MB1	Ammonia, as N	95.0	2.5 u	100	95.0	1.0
		Ammonia, as N MSD	104	2.5 u	100	104.0	1.0
BLANK10	02LSD015-MB1	Sulfide	216	20.0 u	226	95.9	1.0

INORGANICS DUPLICATE SPIKE REPORT 05/31/02

CLIENT: TNUHANFORD B02-050 H1760 LVL LOT #: 0204L529

WORK ORDER: 11343-606-001-9999-00

SPIKE#1 SPIKE#2

SAMPLE	SITE ID	ANALYTE	*RECOV	*RECOV	*DIFF
	*************	**********		*****	
BLANK10	02LAMA09-MB1	Ammonia, as N	95.0	104.0	9.0

INORGANICS PRECISION REPORT 05/31/02

CLIBNT: TNUHANFORD B02-050 H1760 LVL LOT #: 0204L529

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	FACTOR (REP)
	*************		*******		*****	*********
-001RBP	B14DJ8	% Solids	92.8	93.4	0.66	1.0
		Fluoride by IC	1.3 u	1.3 u	NC	1.0
		Nitrate by IC	24.2	23.7	2.3	1.0
		Chromium VI	0.43u	0.43u	NC	1.0
		Sulfate by IC	4.2	4.1	1.2	1.0
		Hydrazine	1.0 u	1.1 u	NC	1.0
		Nitrate Nitrite	5.3	5.0	5.3	1.0
		Ammonia, as N	2.9 u	3.0 u	NC	1.0
		Sulfide	20.B u	23.0 u	NC	1.0

02040				dy Tran								Re	qu	es	l Pa	age _	<u>_</u> of		-	1		V	L	1
										A	\mathcal{B}	2	D_	E	F	G	<u> H</u>		I	Z.	<u> </u>	L	новаток	1146
Client ///	NFO	LD	B02-0	50		:	Refrige	rator#		ì	5	5	5	5	5	5	5		5	5	5	5		
Est. Final Pro	. Samp	ling Date _					#/Type	Container	Liquid	: کیا ہوکار					3					1				- 4
Project #		(343-	606-001	-9999-00) <u></u>		#/. / pc		Solid	IAG	146	146	116	IAG	IAG	IAL	1/16-		IAG	IPL	IAC	IAG	14) 14)	
Project Conta	ct/Phor	o#			<u>.</u>		Volume	,	Liquid	100	All City							2					マ	
Lionville Labo	oratory			05					Solid	250	250	250	250	/20	250	100	25		IDD.	L	250	<i>(એ</i>)	Ŀ	
ac 3/0	<u></u>	Del 57	ひTAT	30 y	art -		Preserv	/atives	المسلم	_	-	ANIC			NCOI		INC	<u> </u>	501			12	٠	
Date Rec'd	4 -3	0-02	Date Due .	5-30-6	<u> </u>		ANALY REQUE		-	V OA	T	PCB PCB	Herb	Est	GUC Ket	Hey	Metal	S	ORV OKO	TC ANIA	Met	ASSAULT OF	CCA	
MATRIX					T M	itrix					<u> </u>	<u> </u>	1		Lionv	ile La	borat	ory U	se Ont	y	1		<u></u> <u></u>	
CODES: S - Soil SE - Sediment SO - Solid	Lab ID	i	Client ID/Descr	iption	Ch	osen V)	Matrix	Date Collected	Time Collected	X4790	X 5790	06 CB	OHBGN	14000	OGCSC	ECRO	METO		02/00	TWORED	LTap	HYEN	RCRATTEN	
SL - Sludge W - Water	301	214	N = 0		MS	MSD	_	1/-17-A 3	43443		12		7	-	-	-		-	7	7	7	-	<u> </u>	
O - Oil A - Air	001		D78	<u> </u>	<u>"</u>	1	5	4-23-02	1240	1	-	1	<i>I</i> -	1_	1		1	-	-	<i>F</i>	<i>t</i>	1		
DS - Drum Solids	200	BILLD	JB tel	p of 001	1_	-	<u> </u>	*			-	├							1-	<u> </u>	-			
DL - Drum Liquids	 -	 			4	-	<u> </u>			- gr - 5	_	 						_	<u> </u>		<u> </u>		7	
L - EP/TCLP Leachate					4								-					 	+					
WI - Wipe	<u> </u>	<u> </u>			 			01			<u> </u>							ļ	<u> </u>			11.57		
X - Other F - Fish			<u></u>				1.00				ļ								<u> </u>		ļ			
		<u> </u>			1_						-	-	<u> </u>			ــــــــــــــــــــــــــــــــــــــ	<u> </u>	1	1_		٠	1		
						ļ				2.7									<u> </u>		<u> </u>			
4		ļ										 							1	<u> </u>			2.00	
·	<u>L</u>	<u>Ĺ</u>		·	<u> </u>	<u>L</u> _		<u> *</u>	Su	Las	ch	ron				<u> </u>	<u>l </u>	1			<u> </u>	<u> </u>		
INOR						OSITE	2. ICFL 3. Alca 4 5 Received by	hols. G	LC: Ly co	50 4. (; .+	INH Katon	Disc Sam COC NOT	TAI3 N	ies Betribels aird? Y	ween and or	11 H A 2 2 3 C 4 P) Shipp and De irititi #) Ambid) Recei condition) Samp roperty) Recei lolding	were: ed Alivered Ant or Con Nes Presen	or hilled 3000d w N	Ta 1) Pa 2) Pa 3) 4) Si Ci	mper Res Presen ackage Unbrok ackage Presen (Unbrok ample OC Rec pon San	istant Sec (CO) Ou Y or erron (C Y or From Sa Y or or or or or Pron Or Pron ter N Outer N mple N		

U2046 7 Q4

Bechtel Han	ford Inc.	CI	HAIN OF CUST	ODY/S	SAMPI	LE ANAI	YSIS	R	EQUEST		B02	2-050-01	Page 1	of 2
Collector R. Fahlberg/R. Nielson		Comps Dua	nny Contact ne Jacques	Telepho 372-9					oject Coordin RENT, SJ	ator	Price Code	8N	Data Tur	
Project Designation 216-Z-11 Ditch Borehole S	Samples		Sampling Location SAF No. 200 West B02-050								Air Quality		45 J	Days ———
Ice Chest No.	-02-008	Field I	Logbook No. 1517-		COA B20CW	V5674C	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>		ethod of Shipn Federal Expres					
Shipped 10 TMARECRA		1	Property No. A	57 F	SHE	8		Bi	ill of Lading/A	ir Bul No	05	pc		
POSSIBLE SAMPLE HA	ZARDS/REMARKS		, ,				1 _							
Radioactive Potes	MILLI	. —	Preservation	Cool 4C	Cool 4	C Cool 4C	Coo	oi 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Tie	TO B14D	4	Type of Container	aG	aG	aG	I	P	aG	ъG	aG	aG	aG	aG
Special Handling and/	or Storage			1	1	1	 	ì	1	1	1	1 1	1	1
1	00L		No. of Container(s)	120mL	250m	L 120mL	100	0mL	120mL	250mL	120mL	250mL	250mL	250mL
			Volume	120002	1 2000	124112	100	· · · · · · · · · · · · · · · · · · ·		2003.20	1-0			
	SAMPLE ANAL	ysis		See item (1) i Special Instructions	Specia	d Hex - 719	6 Spe	m (3) is ecial actions.	D1385	PCBs - 800	Pesticides - 8081	Herbicides - 8150A	See item (4) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015 (Methanol)
Sample No.	Matrix *	Sample Date	Sample Time											
B14DJ8	SOIL	4-23-0	2 1240	X	X	X		<u>X</u>	X	X	X	X	X	Χ
:					<u> </u>							-		
							-						1	
							 							
CHAIN OF POSSES	SSION	Sign/Prir	nt Names		s	PECIAL INS	TRUCTI	IONS	<u></u>				<u> </u>	Matrix *
Relinquished By/Removed From	Date/Time 6 t			ate/Time		See COC comme			_			Lead		5~Soil
Referenced From Property of Pr	728 U-Z1-	Received By Sto		ate/Time	16Z	Mercury (TCLP) (2) ICP Metals - ICP Metals - 601 Molybdenum, Ni	- 1311/747 6010A (St 0A (Super ckel, Vana	70 upertra trace / sdium,	1/6010 {Arsenic, l race) {Arsenic, Ba Add-On) (Beryllin , Zinc}; Mercury	rium, Cadn um, Boron, - 7470 - (C	nium, Chromium Copper, Magnes V)	nn Selenium, S , Lead, Seleniu ium, Manganes	m, Silver}; se,	SB-Sedicurat SO-Selid SI-Skudge W - Water O-Oä A-Air D3-Dram Selids
Reliaquished Backemoved From	ETC 4.291	Received By/Sto	ay= // "	Date/Time			A (TCL); \	VOA -	Nitrate, Sulfate); - 8260A (Add-On)					DL=Drum Liquida T=Timus WI=Wips L=Liquid
Relinquished By/Removed From		Received By/Sto		Date/Time		Person relinq	incl not s	avail: iples	from the 3728	,				V=Vegetation X=Other
Relinquished By/Removed From	n Date/Time	Received By/Sto	ored In I	Date/Time		Ref#	IIT o)	1/27/11					
LABORATORY Receive	ved By	1			Title		•				<u> </u>		Date/Time	
FINAL SAMPLE Dispo	sai Method						isposed By	y					Date/Time	

Bechtel Hanf	ord Inc.	C	HAIN OF CUST	CODY/S	SAMI	PLE A	NA	LY	SI	S R	EQUES	T		B 0	2-050-01	Page 2	of <u>2</u>
Collector R. Fahlberg/R. Nielson											oject Coor ENT, SJ	linator	Price Code 8N			Data Tu	maround
Project Designation 216-Z-11 Ditch Borehole S	amples		Sampling Location 200 West							F No. 2-050		Air Quality 🔲			45	Days	
Ice Chest No. ERC	800-50	Field 1	Logbook No. 1517-		CO/ B200	A CW56740	;				ethod of Sh Federal Exp	ress	'				
Shipped T TMA RECRA		Offsite	e Property No. A	ØZÓ	DE	38				Bi	ll of Ladin	/Air Bill	No.	e 0	SPC.		
POSSIBLE SAMPLE HAZ			ĺ '	Cool 4C		14C 1		4.07	N	ı			l				
Radioactive Poten			Preservation				4		_		74.0Z						
TIET Special Handling and/o	OBI4UL	+	Type of Container	aG	a	G				aG		<u> </u>					
			No. of Container(s)	1		ì	1			1							
Cor)		Volume	250mL		mL	1000m	. 1	- 1	110mL							
				RUN 4-1		Diesel Se	A rd '	+ 46 U 21 in 1		<i>ل ا</i> 10 (20 m	i i lo 02	+				ļ	
	SAMPLE ANA	Lysis		Special 5 Instructions	Ran WTP TPH-G Ran	ge -	Specia structio	طن	S	pecial 7 netions.							
Sample No.	Matrix *	Sample Date	Sample Time														
B14DJ8	SOIL	4-23-0	x 1240	Χ)	(X		,	K							
												<u> </u>				<u> </u>	
	_				-			4				_					
CHAIN OF POSSESS	TON	Sign/Prin	ut Names			SPECIA	T TAIC	STDI	ICT.	TONE						<u> </u>	Matrix *
Retinquished By/Removed From	Date/Time /6/		red la D	Date/Time	15	See COC RIN4-16-	comm	ents o	n SA	F		7704 (44	1 en 1	1 2 4 Tri	thylbenzene, Cyc	a.a	S-Soil SE-Sodiment
Reunquished By/Removed Fram	1478 U.797	3	ed in P. Thors		300 02	Tributyl j	hosph	ate} 	mole	At Co	rimony - (sium-134 Ce	Հ 5 ։ստ.137 <i>Հ</i>	obelt 6	O. E	n-152, Buropium Rochum-292), G		SO=Solid SI=Studge W = Water O=Oil
Religional By/Removed F Juny	177	POR STANDARD STANDARD	1202	Pater Time 4		Noptunia	n 337 no Plu	, Disele	d 63 15 Au	; Stron	 89,90	Fotal-Or, T	-chaotic	wu-99, Triti	um • 115, Isotopi ricium 241/Curi	-Uranium	A#Air DS=Drum Solids DL=Drum Liquids T=Tissue
Religioushed By/Removed From	Date/Time 30-02 / 009	Received By/610	god In Dig -30	Pate/Time -マン / クロ	,5-1		,		•						1 27	.z4.22	Wi-Wipe L-Liquid
Relinquished By/Removed From	Date/Time	Received By/Sto		ate/Time			Pe rei	rson Iinqu	nel ı işhə	not av Sampi	ailable to es.from the	3728	•		•		V=Vegetation X=Other
Relinquished By/Removed From	Date/Time	Received By/Sto	red In D	ate/Time			Re	f#_	<u> 11)</u>	On_	es from the	02					
LABORATORY Receive	i By			1	litle							•		• • •	Ī	Date/Time	
FINAL SAMPLE Disposa DISPOSITION	1 Method						I	Dispos	ed B	у					"	Date/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 4.30.0ン

SAF#/SOW#/Release #: BOZ - 050

Laboratory SDG #: 02041529

1.	Custody seals on coolers or shipping	□\Ves	□ No	□ N/A	see Comment
	container intact, signed and dated?				
2.	Outside of coolers or shipping containers are	□X es	□No	□ N/A	☐ see Comment
	free from damage?	,	. —		
3.	Airbill # recorded?	DY Yes	□ No	□ N/A	☐ see Comment
4.	All expected paperwork received (coc and	D.Ves	. □ No	□ N/A	□ see Comment
	other client specific: historical data, alpha/beta or other screening data as	ر ده دې	. 140	UIVA	D see Connien
	applicable)? (paperwork sealed in plastic				
	bag and taped to inside lid)				
5.	Sample containers are intact?	□ Yes	□ No	□ N/A	□ see Comment
6.	Custody seals on sample containers intact,	D, Yes	□ No	□ N/A	☐ see Commen
	signed and dated?	1			
7.	All samples on coc received?	DX es	□ No	□ N/A	see Commen
8.	All sample label information matches coc?	□,χ e s	□ No	D N/A	□ see Commen
9.	Laboratory QC samples designated on coc?	₽ Yes	□ No	□ N/A	☐ see Commen
	(QC stickers placed on bottles?)	/			
10.	Shipment meets LvLl Sample Acceptance	₩ Yes	□ No	□ N/A	☐ see Commen
	Policy? (identify all bottles not within policy. See reverse side for policy)	•			
11,.	Where applicable, bar code labels are	□ Yes	□ No	D)WA	🗆 see Commen
	affixed to coc?		•	•	
12.	coc signed and dated?	"DŽ Yes	□ No	□ N/A	See Commen
13.	coc faxed or emailed to client?	Yes	□ No	□ N/A	🗖 see Commer
14.	Project Manager/Client contacted	□ Yes	□ No	₽ N/A	□ see Commer
	concerning discrepancies? (name/date)	□ 1€3	D 140	WE IN/A	D AC COMMISS.

Cooler # / temp and Comments:

1.50

Laboratory Sample Custodian:

Laboratory Project Manager: